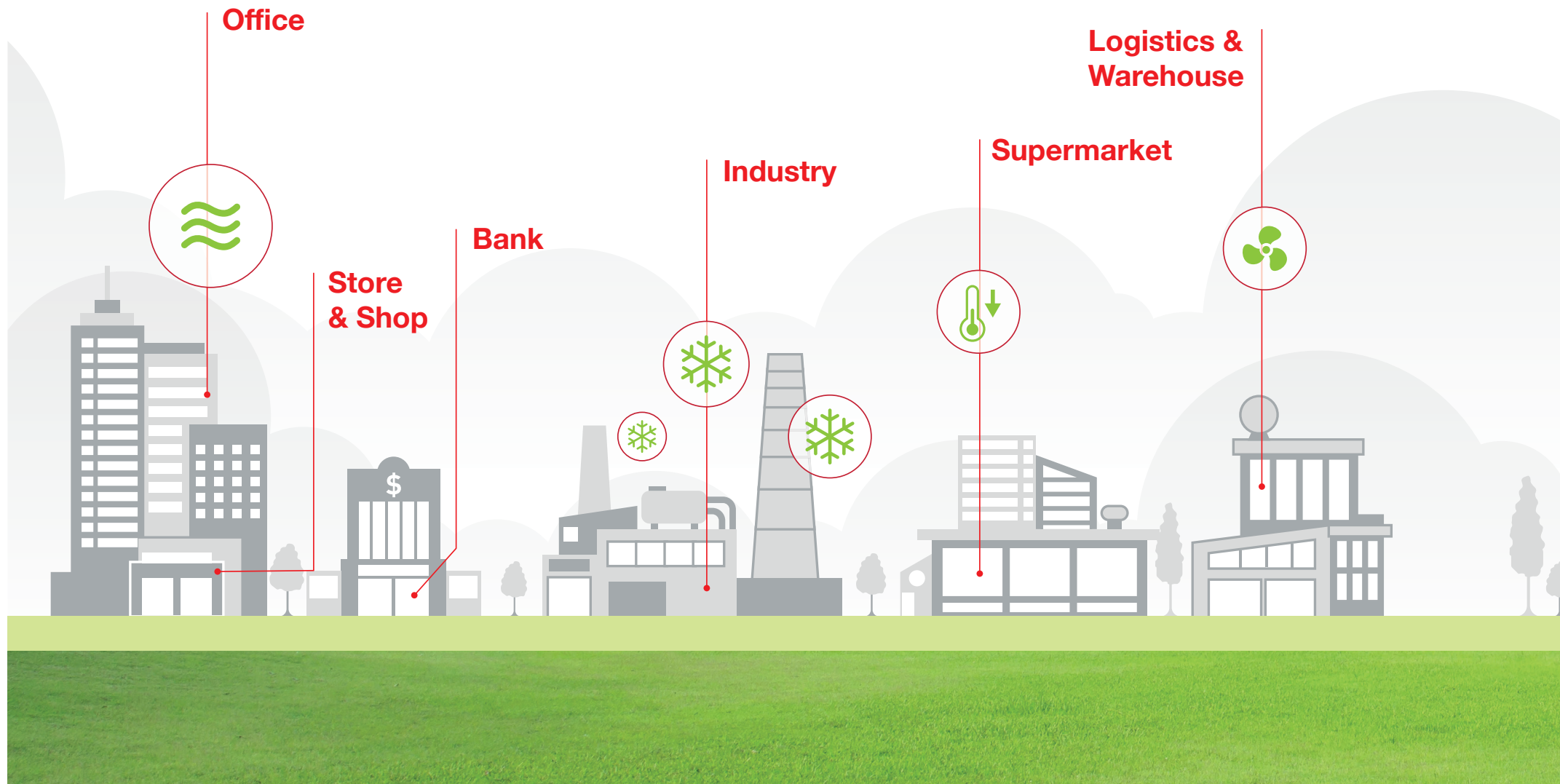




YANMAR ENERGY SYSTEMS



YANMAR ENERGY SYSTEMS





A Sustainable Future

Yanmar began in Japan over 100 years ago with a mission to provide sustainable and innovative solutions aimed at serving the needs of people while conserving fuel. With the expansion of Yanmar into the global market they remain dedicated to efficiency and the environment which has resulted in substantial long-term savings for their customers. Yanmar Energy Systems are proud to have created a wide range of energy solutions using gas engine technology which reflect the needs of the market in terms of energy and the environment for our customers. Yanmar Energy Systems have created energy-responsible systems, including our VRF, combined heat and power (CHP) and power generation systems. These systems can work independently or be integrated with each other and your current systems, creating even greater efficiency and cost savings.

More Than Solutions

We are experts at providing creative solutions to the challenges our customers face by using a combination of our superior products, exceptional customer service and our continually innovative engineering and technology. Together, we will find the best solution to meet the needs of both you and the environment.

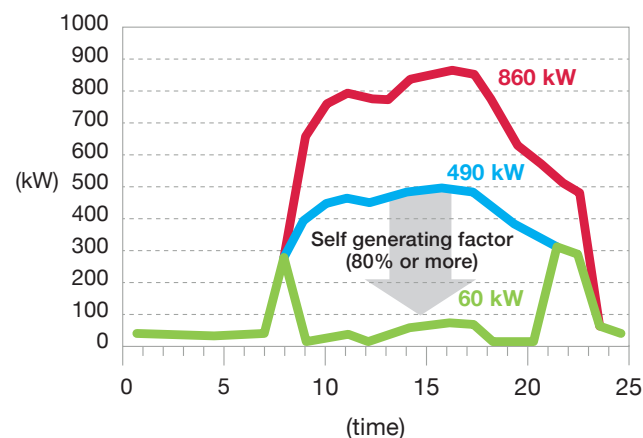
Flying-Y Building

Yanmar Headquarters

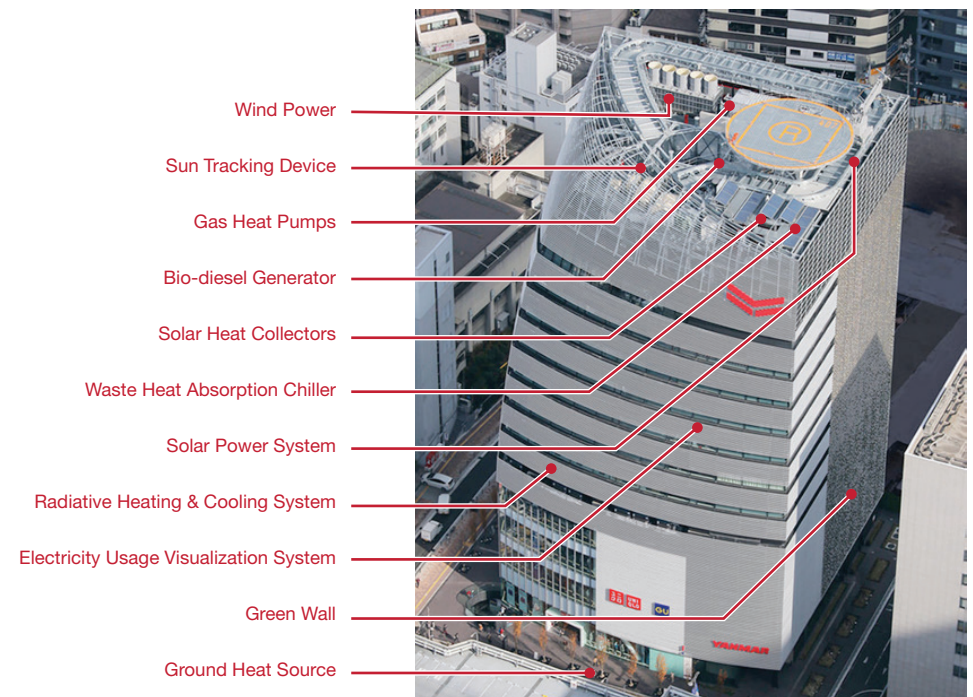
Yanmar Head Office in Osaka Japan, is known as the Flying-Y building. The building represents the sustainable future that Yanmar believes in. Energy saving and CO2 reduction systems are incorporated in the building.

Energy saving effect (summer peak day)

Yanmar Office Area (around 10.000 m2)



— Electric Heat Pump (Fluorescent lighting) — Flying-Y Building (LED lighting, GHP) — Flying-Y Building (Solar, cogeneration)



CONTENTS

System Overview 6

Benefits of Gas Powered Air Conditioning

Outdoor Units 10

Heat Pump
Heat Pump Hot Water
Heat Recovery

Indoor Units 21

YZCP Cassette Indoor Unit
YZDP Ducted Indoor Unit
YZSDP Slim Ducted Indoor Unit
YZAP Wall Mounted Indoor Unit
YZHP Under Ceiling Indoor Unit

BS Units 39

YBSVP Branch Selector Unit

Controls 41

LC1E62 Remote Controller
LCMS Net - Advanced Multi Use Controller
DCS601C51 - Intelligent Touch Controller
DCM601A51 - Intelligent Touch Manager
DMS502B51 - BACnet Interface
DMS502B51 / LV256B2 - AC Manager

Specifications 53

Benefits of Gas Powered Air Conditioning

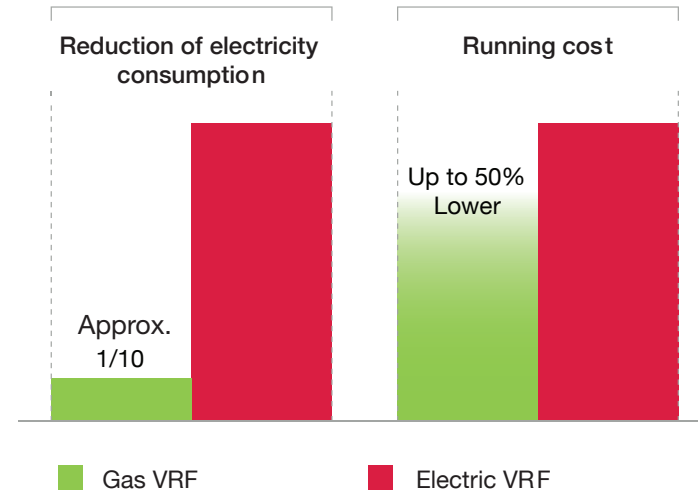
1 Capital Cost Savings

Reduced Electric Infrastructure

A Gas Powered VRF condenser consumes around 90% less electricity than a similar electric condenser. Therefore, where power to the site is limited and upgrade costs are prohibitive, Gas Powered VRF systems provide a solution which can reduce the overall capital cost of the project.

A Gas Powered VRF condenser operates on single phase power and significantly reduces electrical infrastructure and associated costs.

Electrical infrastructure often requires floor space; reducing the size of electrical infrastructure often expands the floor area available to the developer and increases the commercial value of the building.



2 Efficiency

Reduced Operating Costs

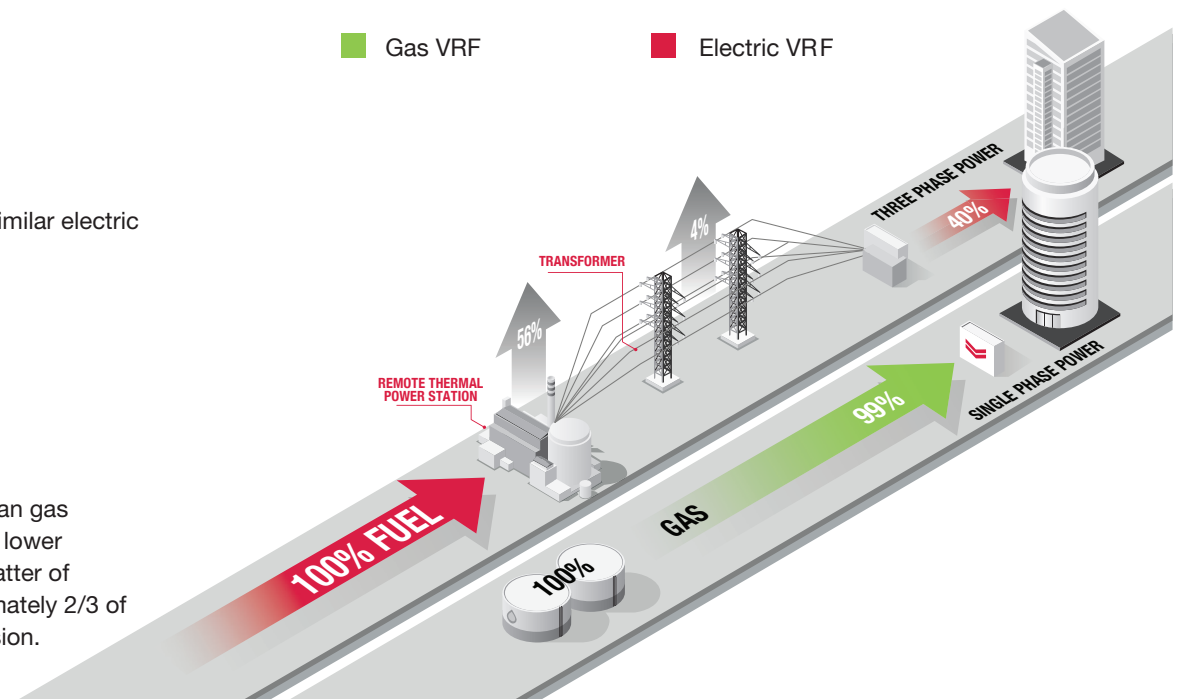
A Gas Powered VRF system can provide up to 50% lower running costs than similar electric air conditioning systems.

The actual running cost benefit depends on the local gas and electricity tariffs.

3 Environmental

Reduced Greenhouse Gas Emissions

Electrical air conditioning systems are significantly more greenhouse intense than gas powered air conditioning. This difference is not simply because natural gas is a lower greenhouse energy source compared with electricity generation. It is more a matter of recognising the inefficiency of the electrical generation process where approximately 2/3 of the energy in the primary fuel is lost at the power station and through transmission.



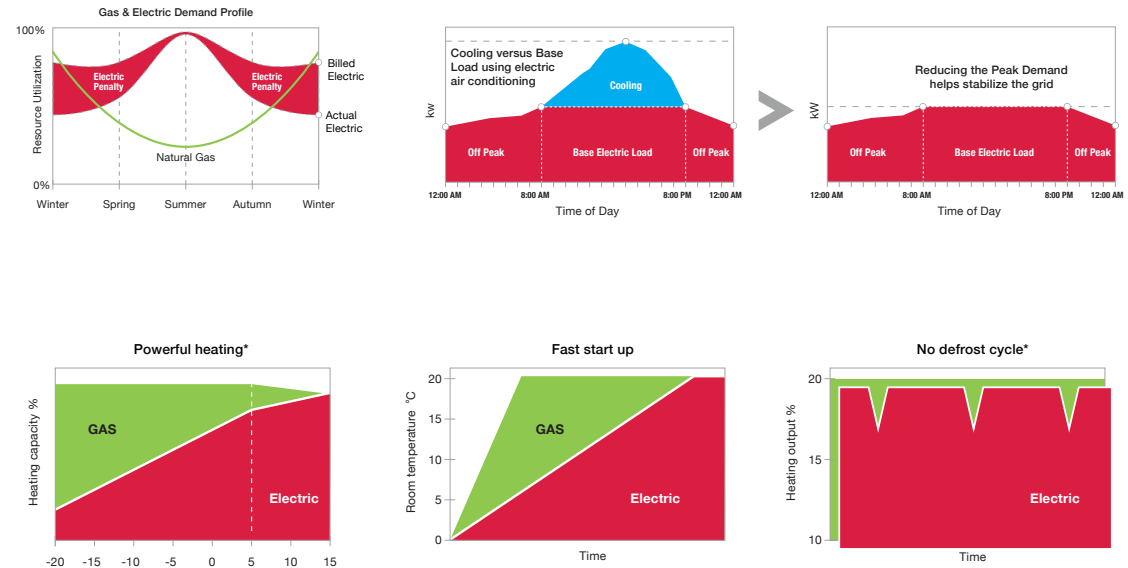
4 Peak Demand

Reduced Peak Demand Charges

The demand for air-conditioning in Australia is growing at a rapid rate and is expected to continue growing over the coming years.

This growth is creating a substantial rise in the demand for power to run air conditioning and there are concerns about a shortage of power generation and transmission capacity during peak periods. This has led to new regulations to manage peak demand and significant investment in transmission infrastructure. In some regions, peak demand charges can account for up to 50% of the electricity bill, penalising all electrical consumption.

Gas Powered VRF systems help avoid peak demand charges, thereby reducing operating costs. Flattening their demand profile in this way can also help customers to negotiate a more competitive tariff structure from their electricity supplier.



5 Engine Heat Recovery

Improved Heating Performance

In a Gas Powered VRF system, utilising heat from the engine overcomes many of the operational issues that apply to electric VRF systems.

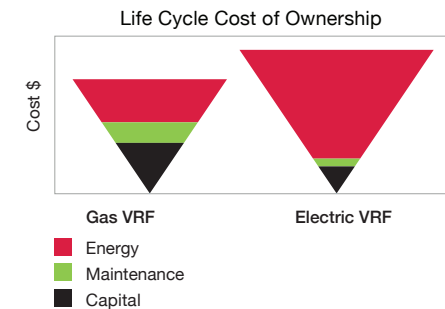
With electric systems, defrost cycles in cold regions can operate for up to 10min in every hour, during this period the indoor environment is compromised and the system struggles with low indoor and outdoor conditions before it effectively heats again.

The Gas Powered VRF system employs a plate heat exchanger to transfer engine heat to the refrigerant cycle, this available heat source accordingly raises the system operating pressures and avoids the need for long defrost cycles. This ensures a constant indoor environment.

6 Lifecycle Costs

Considering Full Costs Of Ownership

While the Gas Powered VRF system has a higher initial capital cost and maintenance component, the lower operating costs, capital infrastructure costs and emissions mean that the system lifecycle cost is generally lower than an electric VRF system over the life of the equipment.



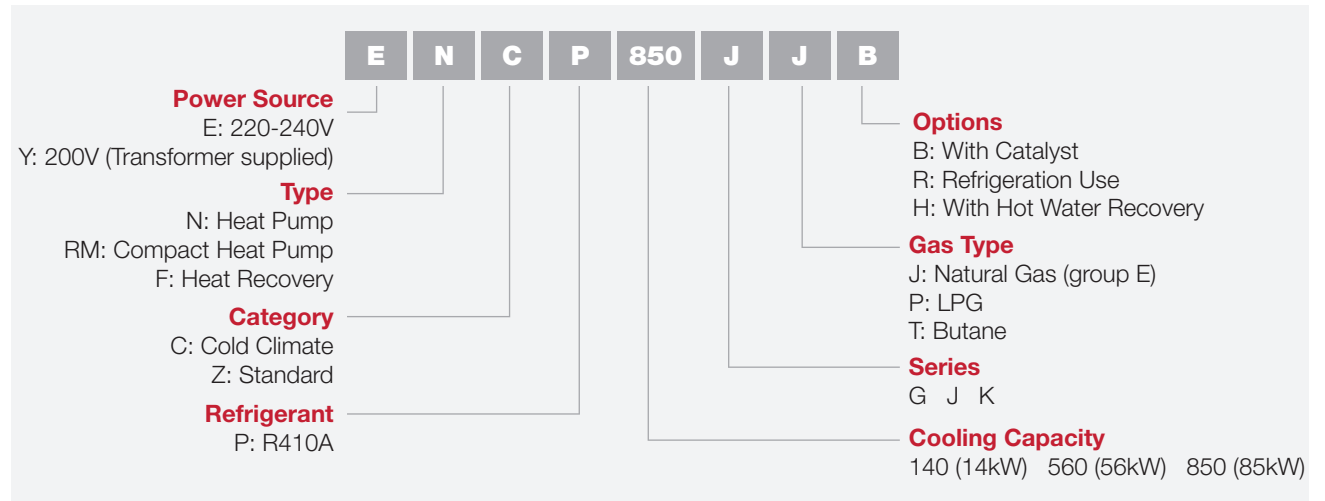
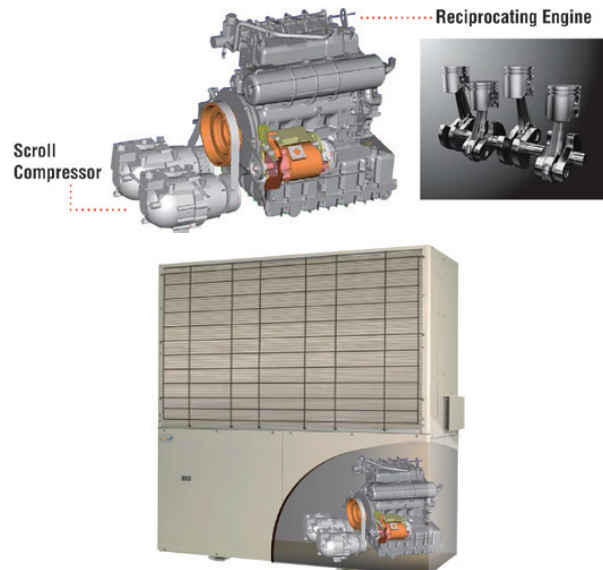
Note: The drawing is indicative only and is dependent on energy tariffs and demand charges in the given region.

VRF System

VRF is an acronym for Variable Refrigerant Flow. It applies to an outdoor unit with a multiple of indoor units in various capacities and types connected via a DX network of refrigerant pipes. Each Indoor unit has the ability to operate independently of other Indoor units controlled by a sophisticated proprietary control system.

A Gas Powered VRF System

A Gas Powered VRF system is similar to an electric VRF system, except for the outdoor unit. In a Gas Powered VRF system a natural gas or LPG engine drives the compressor(s) that compresses the refrigerant. The engine speed varies to regulate the refrigerant volume in a similar fashion to an inverter compressor.



Outdoor Range

Type	14	18	22	28	35	45	56	71	85
Heat Pump									
Model	YRMP140G1	YRMP180G1	YNZP224K	YNZP280K	YNZP355K	ENCP450J	ENCP560J	ENCP710J	ENCP850J
Heat Recovery									
Model							EFZP560J		EFZP850J
Heat Pump Hot Water									
Model									ENCP850JH

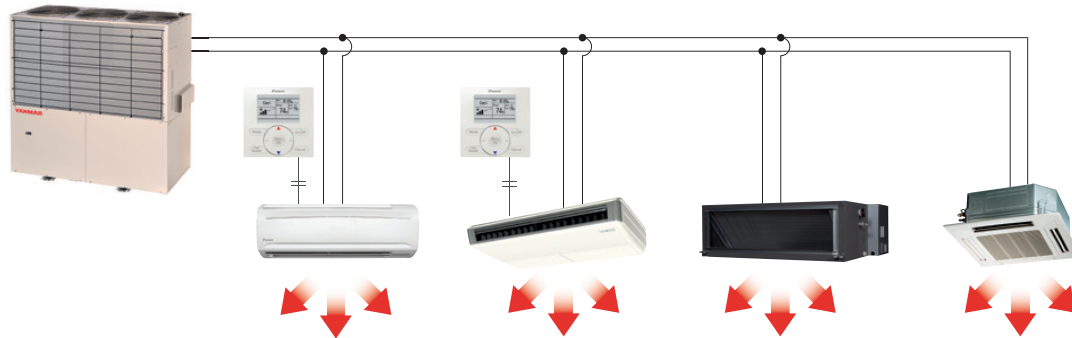
GAS POWERED VRF SYSTEMS

GAS POWERED CHILLER & HYDRONIC SYSTEMS

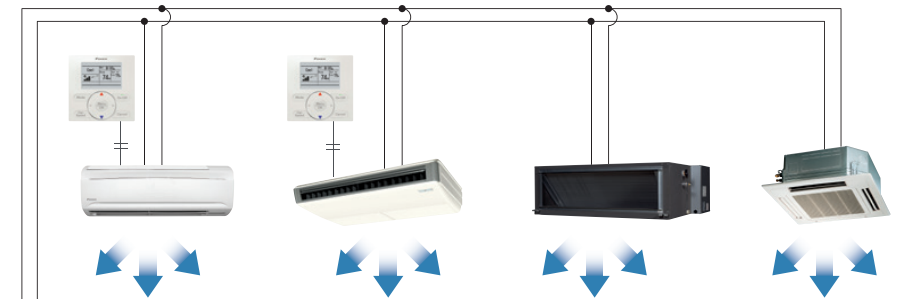
GAS POWERED GENERATOR & MICRO COGENERATION

GAS POWERED REFRIGERATION

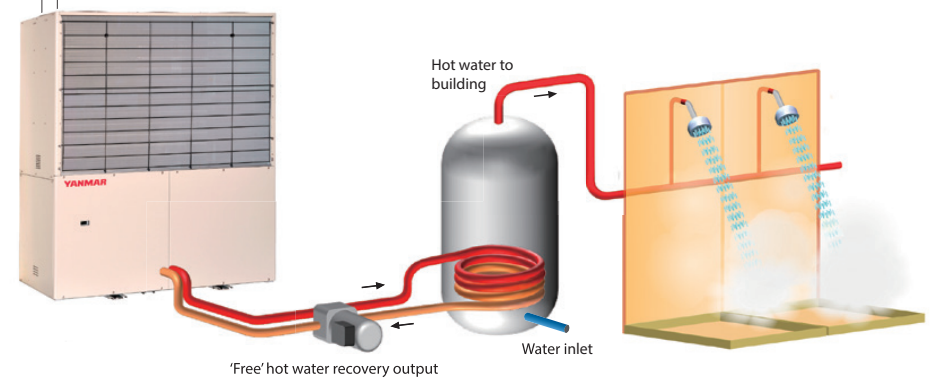
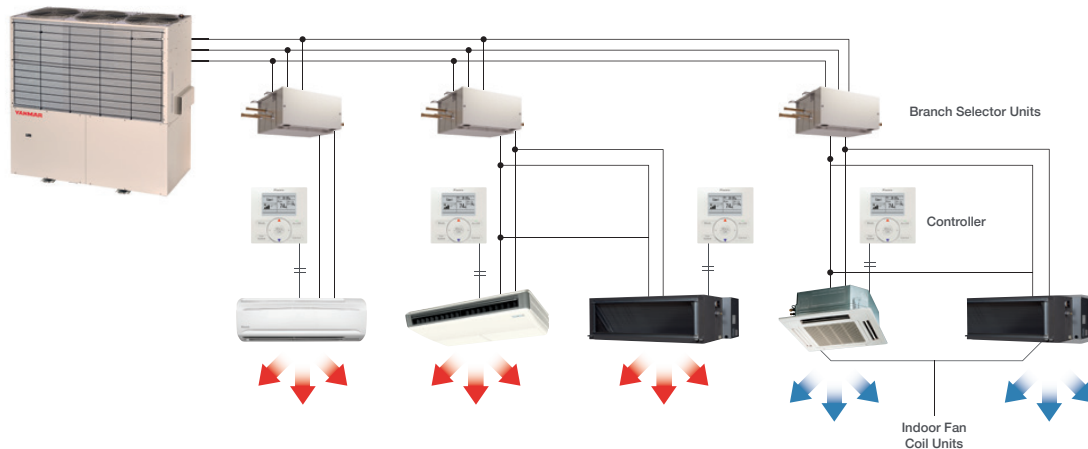
Heat Pump



Heat Pump Hot Water



Heat Recovery

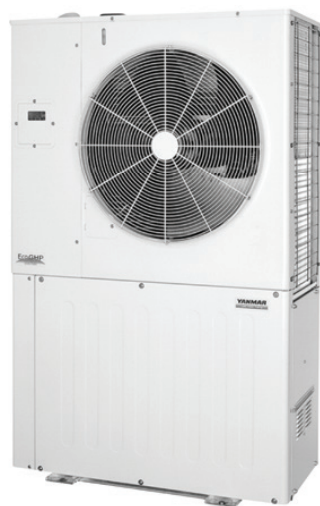




Model: **YRMP140G**
YRMP180G

COMPACT HEAT PUMP

- Available in a common 14kW and 18kW chassis
- Consumes less than 3 amps single phase
- 10,000 Hr engine maintenance intervals
- Made in Japan



G Series - Technical Data

Model			YRMP140G	YRMP180G
Type			Heat Pump (Natural Gas / LPG)	
Capacity	Cooling Output	kW	14	18
	Heating Output	kW	16	20
Fuel Gas Consumption (HHV) Per Hour	Cooling Input	kW /MJ	11.8 / 43	14.2 / 51
	Heating Input	kW /MJ	11.2 / 40	13.7 / 49
	Maximum Input	kW /MJ	17.9 / 64	19.6 / 71
	Natural Gas Supply Pressure	kPa	1.0~ 2.5	
Electrical Characteristics	Power Supply	V / Hz /Ph	240-> 200 /50/1	
	Starting Current	A	20	
	Operating Current (Cooling)	A	2.02	2.45
	Operating Current (Heating)	A	2.12	2.63
	Power Consumption (Cooling)	kW	0.38	0.47
	Power Consumption (Heating)	kW	0.39	0.50
Dimensions	Height	mm	1,740	
	Width	mm	1,100	
	Depth	mm	500	
Weight		kg	380	
Noise Data	Sound Pressure - Normal Mode	dB (A)	48	52
	Sound Pressure - Quiet mode	dB (A)	45	49
Fans	Airflow	L/s	1466	1882
	External Static Pressure	Pa	0	
Refrigerant	Type	-	R410A	
	Factory Charge	kg	7.4	8.4
Piping	Refrigerant Gas Pipe	mm	Ø15.9	Ø19.1
	Refrigerant Liquid Pipe	mm	Ø9.5	
	Fuel Gas Pipe	-	R1/2	
	Exhaust Vent (Outside Dia.)	mm	Ø120	
	Drain Pipe (Inside Dia.)	mm	Ø16	
Indoor Unit	Total Connection Capacity (I/U)	%	50~130	
	Minimum Indoor Unit Operation	-	2.2kW	
	Maximum No. of Indoor Units	-	8	10
Max total piping length		m	100	
Allowable one way refrigerant piping length		m	60	
Allowable piping length (after the first branch)		m	20	
Height difference between Indoor and Outdoor units		m	30	
Height difference between Indoor units		m	15	

ISO T1 Condition: Indoor temp.: 27°CDB, 19°CWB / outdoor temp.: 35°CDB

ISO H1 Condition: Indoor temp.: 20°CDB / outdoor temp.: 7°CDB, 6°CWB



Model: **YNZP224K**
YNZP280K
YNZP355K

HEAT PUMP

- Available in a common 22.4kW, 28.0 and 35.5kW chassis
- Heat pump system for cooling or heating operation
- Consumes less than 5 amps single phase
- 10,000 Hr engine maintenance intervals
- Made in Japan



K Series - Technical Data

Model			YNZP224K	YNZP280K	YNZP355K
Type	Heat Pump (Natural Gas / LPG)				
Capacity	Cooling Output	kW	22.4	28.0	35.5
	Heating Output	kW	25.0	31.5	40.0
Fuel Gas Consumption (HHV) Per Hour	Cooling Input	kW / MJ	17.5 / 63.0	22.3 / 80.2	25.5 / 91.8
	Heating Input	kW / MJ	17.9 / 64.4	22.9 / 82.4	27.1 / 97.5
	Maximum Input	kW / MJ	30.4 / 109.9	38.9 / 140.1	46.1 / 165.8
	Natural Gas Supply Pressure	kPa	1.0~ 2.5		
Electrical characteristics	Power Supply	V / Hz / Ph	240-> 200 /50/1		
	Starting Current	A	20		
	Operating Current (Cooling)	A	3.79	3.73	4.23
	Operating Current (Heating)	A	3.60	3.61	4.21
	Power Consumption (Cooling)	kW	0.61	0.60	0.68
	Power Consumption (Heating)	kW	0.58	0.58	0.68
Dimensions	Height	mm	2,150		
	Width	mm	1,470		
	Depth	mm	800		
Weight		kg	680		
Noise Data	Sound Pressure - Normal Mode	dB (A)	54	54	56
	Sound Pressure - Quiet mode	dB (A)	51	51	53
Fans	Airflow	L/s	5500		
	External Static Pressure	Pa	0 / 30		
Refrigerant	Type	-	R410A		
	Factory Charge	kg	11.1	11.8	11.8
Piping	Refrigerant Gas Pipe (< 90M)	mm	Ø19.1	Ø22.2	Ø25.4
	Refrigerant Gas Pipe (> 90M)	mm	Ø22.2	Ø25.4	Ø28.6
	Refrigerant Liquid Pipe	mm	Ø9.5		
	Fuel Gas Pipe	-	R3/4		
	Exhaust Vent (Outside Dia.)	mm	Ø60.5		
	Drain Pipe (Inside Dia.)	mm	Ø15		
Indoor Unit	To Tal Connection Capacity (I/U)	%	50~130		
	Minimum Indoor Unit Operation	-	2.2kW		
	Maximum No. of Indoor Units	-	13	16	20
Max total piping length		m	640		
Allowable one way refrigerant piping length		m	170		
Allowable piping length (after the first branch)		m	90		
Height difference between Indoor and Outdoor units		m	50		
Height difference between indoor units		m	15		

ISO T1 Condition: Indoor temp.: 27°CDB, 19°CWB / outdoor temp.: 35°CDB

ISO H1 Condition: Indoor temp.: 20°CDB / outdoor temp.: 7°CDB, 6°CWB



Model: **ENCP450J**
ENCP560J

HEAT PUMP

- Available in a common 45kW and 56kW chassis
- Heat pump system for cooling or heating operation
- Consumes less than 5 amps single phase
- 10,000 Hr engine maintenance intervals
- Made in Japan



J Series - Technical Data

Model			ENCP450J	ENCP560J
Type			Heat Pump (Natural Gas / LPG)	
Capacity	Cooling Output	kW	45.0	56.0
	Heating Output	kW	50.0	63.0
Fuel Gas Consumption (HHV) Per Hour	Cooling Input	kW /MJ	34.3 / 123.5	45.4 / 163.4
	Heating Input	kW /MJ	32.5 / 117.0	43.1 / 155.2
	Maximum Input	kW /MJ	48.8 / 175.5	64.7 / 245.9
	Natural Gas Supply Pressure	kPa	1.0~ 2.5	
Electrical characteristics	Power Supply	V / Hz /Ph	240 /50/1	
	Starting Current	A	20	
	Operating Current (Cooling)	A	4.16	4.73
	Operating Current (Heating)	A	3.69	4.40
	Power Consumption (Cooling)	kW	0.87	0.99
	Power Consumption (Heating)	kW	0.77	0.92
Dimensions	Height	mm	2,170	
	Width	mm	1,690	
	Depth	mm	800	
Weight		kg	880	890
Noise Data	Sound Pressure - Normal Mode	dB (A)	57	58
	Sound Pressure - Quiet mode	dB (A)	54	55
Fans	Airflow	L/s	6000	6333
	External Static Pressure	Pa	0 / 30	
Refrigerant	Type	–	R410A	
	Factory Charge	kg	11.8	11.8
Piping	Refrigerant Gas Pipe (< 90m)	mm	Ø28.6	
	Refrigerant Gas Pipe (> 90m)	mm	Ø31.8	
	Refrigerant Liquid Pipe	mm	Ø12.7	Ø15.9
	Fuel Gas Pipe	–	R3/4	
	Exhaust Vent (Outside Dia.)	mm	Ø60.5	
	Drain Pipe (Inside Dia.)	mm	Ø15	
Indoor Unit	Total Connection Capacity (I/U)	%	50~130	
	Minimum Indoor Unit Operation	–	2.2kW	
	Maximum No. of Indoor Units	–	26	32
Max total piping length		m	640	
Allowable one way refrigerant piping length		m	170	
Allowable piping length (after the first branch)		m	90	
Height difference between Indoor and Outdoor units		m	50	
Height difference between indoor units		m	15	

ISO T1 Condition: Indoor temp.: 27°CDB, 19°CWB / outdoor temp.: 35°CDB

ISO H1 Condition: Indoor temp.: 20°CDB / outdoor temp.: 7°CDB, 6°CWB



Model: **ENCP710J**
ENCP850J

HEAT PUMP

- Available in a common 71kW and 85kW chassis
- Heat pump system for cooling or heating operation
- Consumes less than 8 amps single phase
- 10,000 Hr engine maintenance intervals
- Made in Japan



J Series - Technical Data

Model			ENCP710J	ENCP850J
Type			Heat Pump (Natural Gas / LPG)	
Capacity	Cooling Output	kW	71.0	85.0
	Heating Output	kW	80.0	95.0
Fuel Gas Consumption (HHV) Per Hour	Cooling Input	kW /MJ	56.7 / 204.1	67.7 / 243.7
	Heating Input	kW /MJ	56.2 / 202.3	66.3 / 238.7
	Maximum Input	kW /MJ	84.3 / 303.4	99.4 / 357.8
	Natural Gas Supply Pressure	kPa	1.0~ 2.5	
Electrical characteristics	Power Supply	V / Hz /Ph	240 /50/1	
	Starting Current	A	25	
	Operating Current (Cooling)	A	6.93	7.93
	Operating Current (Heating)	A	6.50	7.21
	Power Consumption (Cooling)	kW	1.45	1.66
	Power Consumption (Heating)	kW	1.36	1.51
Dimensions	Height	mm	2,170	
	Width	mm	2,100	
	Depth	mm	800	
Weight		kg	1080	
Noise Data	Sound Pressure - Normal Mode	dB (A)	61	62
	Sound Pressure - Quiet mode	dB (A)	58	59
Fans	Airflow	L/s	9000	9500
	External Static Pressure	Pa	0 / 30	
Refrigerant	Type	-	R410A	
	Factory Charge	kg	11.8	11.8
Piping	Refrigerant Gas Pipe (< 90m)	mm	Ø31.8	
	Refrigerant Gas Pipe (> 90m)	mm	Ø34.9	
	Refrigerant Liquid Pipe	mm	Ø19.1	
	Fuel Gas Pipe	-	R3/4	
	Exhaust Vent (Outside Dia.)	mm	Ø60.5	
	Drain Pipe (Inside Dia.)	mm	Ø15	
Indoor Unit	Total Connection Capacity (I/U)	%	50~130	
	Minimum Indoor Unit Operation	-	2.2kW	
	Maximum No. of Indoor Units	-	40	48
Max total piping length		m	640	
Allowable one way refrigerant piping length		m	170	
Allowable piping length (after the first branch)		m	90	
Height difference between Indoor and Outdoor units		m	50	
Height difference between indoor units		m	15	

ISO T1 Condition: Indoor temp.: 27°CDB, 19°CWB / outdoor temp.: 35°CDB

ISO H1 Condition: Indoor temp.: 20°CDB / outdoor temp.: 7°CDB, 6°CWB

Model: **ENCP850JH**

HEAT PUMP with HOT WATER

- Available in 85kW of cooling and up to 30kW of hot water recovery
- Heat pump system for cooling or heating operation
- Consumes less than 8 amps single phase
- 10,000 Hr engine maintenance intervals
- Made in Japan



J Series - Technical Data

Model			ENCP850JH
Type			Heat Pump (Natural Gas / LPG)
Capacity	Cooling Output	KW	85.0
	Heating Output	KW	85.0/95.0
Hot Water Supply	Capacity (Cooling Mode)	KW	30.0
	Capacity (Heating Mode)	KW	10.0
	Hot Water Temperature (Outlet Max)	°C	70.0
	Hot Water Volume Flowrate	L/min	43.0
Rated Fuel Gas Consumption (HHV)	Cooling Input	KW /MJ	67.7 / 243.7
	Heating Input	KW /MJ	66.3 / 238.7
	Maximum Input	KW /MJ	99.4 / 357.8
	Natural Gas Supply Pressure	KPa	1.0~ 2.5
Electrical characteristics	Power Supply	V / Hz / Ph	230 /50/1
	Starting Current	A	25
	Operating Current (Cooling)	A	7.93
	Operating Current (Heating)	A	7.21
	Power Consumption (Cooling)	KW	1.66
	Power Consumption (Heating)	KW	1.51
Dimensions	Height	Mm	2,170
	Width	Mm	2,100
	Depth	Mm	800
Weight		kg	1110
Noise Data	Sound Pressure - Normal Mode	DB (A)	62
	Sound Pressure - Quiet Mode	DB (A)	59
Fans	Airflow	L/s	9500
	External Static Pressure	Pa	0 / 30
Refrigerant	Type	-	R410A
	Factory Charge	Kg	11.8
Piping	Refrigerant Gas Pipe (< 90M)	Mm	Ø31.8
	Refrigerant Gas Pipe (> 90M)	Mm	Ø34.9
	Refrigerant Liquid Pipe	Mm	Ø19.1
	Fuel Gas Pipe	-	R3/4
	Exhaust Vent (Outside Dia.)	Mm	Ø60.5
	Drain Pipe (Inside Dia.)	Mm	Ø15
Indoor Unit	Total Connection Capacity (I/U)	%	50~130
	Minimum Indoor Unit Operation	-	2.2kW
	Maximum No. of Indoor Units	-	48
Max total piping length		m	640
Allowable one way refrigerant piping length		m	170
Allowable piping length (after the first branch)		m	90
Height difference between Indoor and Outdoor units		m	50
Height difference between indoor units		m	15

ISO T1 Condition: Indoor temp.: 27°CDB, 19°CWB / outdoor temp.: 35°CDB

ISO H1 Condition: Indoor temp.: 20°CDB / outdoor temp.: 7°CDB, 6°CWB



Model: **EFZP560J**
EFZP850J

HEAT RECOVERY

- Available in 56kW and 85kW models
- Heat recovery system for simultaneous cooling and heating operations
- Up to 30% more efficient than a heat pump system by redistributing heat energy within the building
- 10,000 Hr engine maintenance intervals
- Made in Japan



J Series - Technical Data

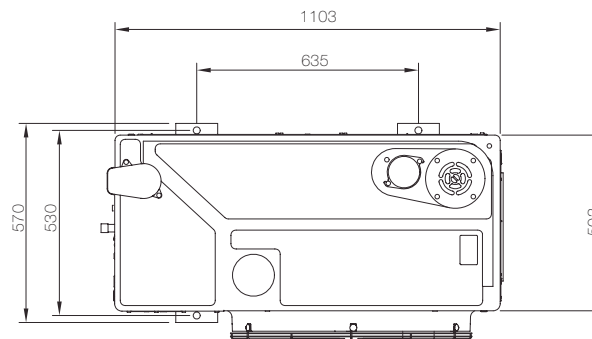
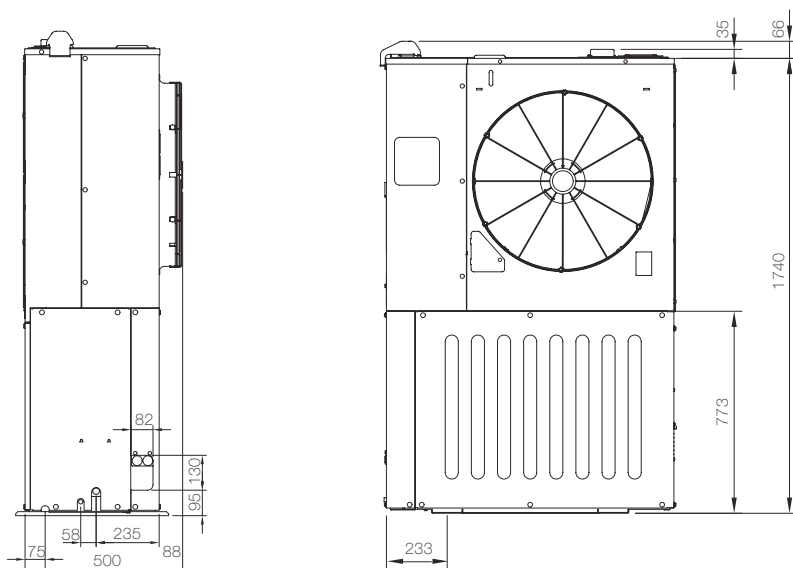
Model			EFZP560J	EFZP850J
Type			Heat Pump (Natural Gas / LPG)	
Capacity	Cooling Output	kW	56.0	85.0
	Heating Output	kW	63.0	95.0
Fuel Gas Consumption (HHV) Per Hour	Cooling Input	kW / MJ	45.4 / 163.4	67.7 / 243.7
	Heating Input	kW / MJ	43.1 / 155.2	66.3 / 238.7
	Maximum Input	kW / MJ	64.7 / 245.9	99.4 / 357.8
	Natural Gas Supply Pressure	kPa	1.0~ 2.5	
Electrical characteristics	Power Supply	V / Hz / Ph	240 / 50/1	
	Starting Current	A	20	25
	Operating Current (Cooling)	A	4.73	7.93
	Operating Current (Heating)	A	4.40	7.21
	Power Consumption (Cooling)	kW	0.99	1.66
	Power Consumption (Heating)	kW	0.92	1.51
Dimensions	Height	mm	2,170	
	Width	mm	2,100	
	Depth	mm	800	
Weight		kg	890	1070
Noise Data	Sound Pressure - Normal Mode	dB (A)	61	62
	Sound Pressure - Quiet Mode	dB (A)	58	59
Fans	Airflow	L/s	9000	9500
	External Static Pressure	Pa	0 / 30	
Refrigerant	Type	-	R410A	
	Factory Charge	kg	11.8	11.8
Piping	Refrigerant Gas Pipe (< 90M)	mm	Ø28.6	Ø31.8
	Refrigerant Gas Pipe (> 90M)	mm	Ø31.8	Ø34.9
	Discharge Pipe		Ø22.2	Ø28.6
	Refrigerant Liquid Pipe	mm	Ø15.9	Ø19.1
	Fuel Gas Pipe	-	R3/4	
	Exhaust Vent (Outside Dia.)	mm	Ø60.5	
Indoor Unit	Drain Pipe (Inside Dia.)	mm	Ø15	
	Total Connection Capacity (I/U)	%	50~130	
	Minimum Indoor Unit Operation	-	2.2kW	
	Maximum No. of Indoor Units	-	40	48
Max total piping length		m	640	
Allowable one way refrigerant piping length		m	170	
Allowable piping length (after the first branch)		m	90	
Height difference between Indoor and Outdoor units		m	50	
Height difference between indoor units		m	15	

ISO T1 Condition: Indoor temp.: 27°CDB, 19°CWB / outdoor temp.: 35°CDB

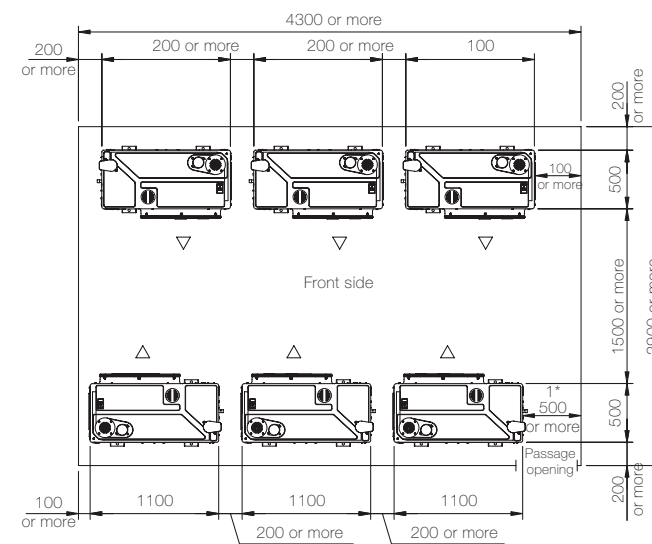
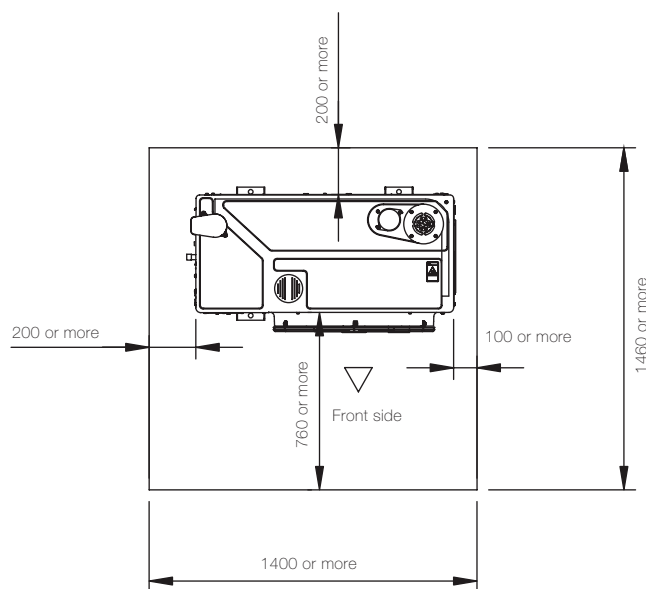
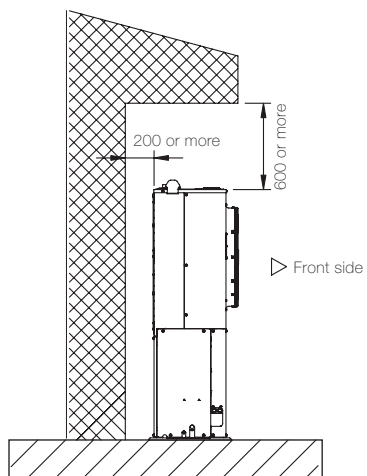
ISO H1 Condition: Indoor temp.: 20°CDB / outdoor temp.: 7°CDB, 6°CWB

MODEL: **YRMP140G / YRMP180G**

DIMENSIONS & CLEARANCES



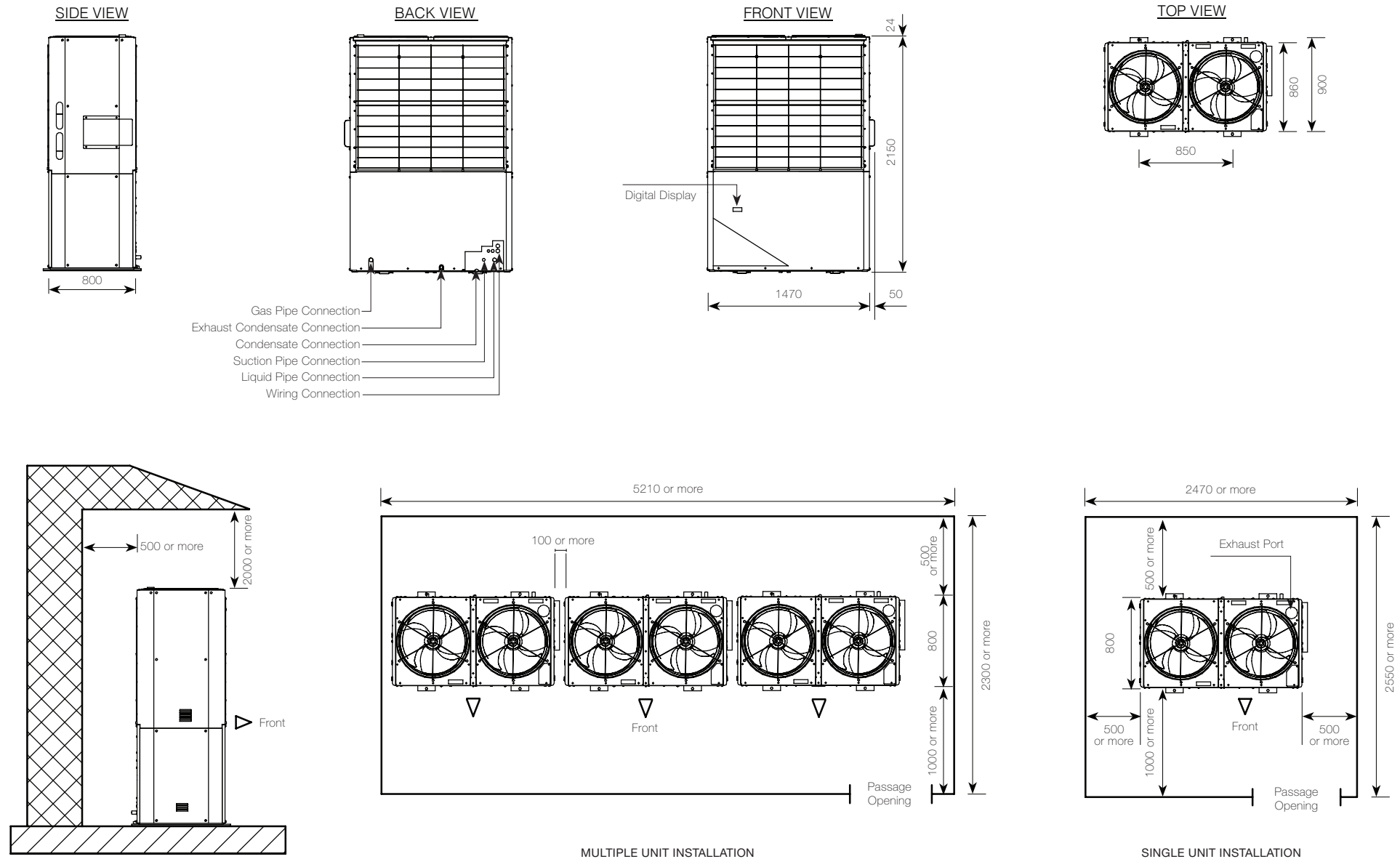
Single unit installation



Multiple unit installation

MODELS: **YNZP224K / YNZP280K / YNZP355K**

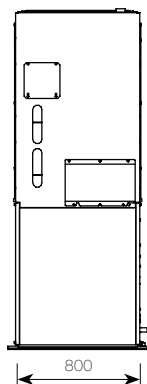
DIMENSIONS & CLEARANCES



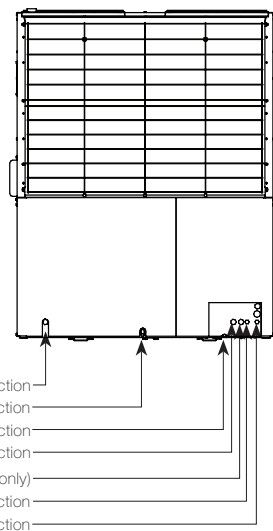
MODELS: **ENCP450J / ENCP560J / EFZP560J**

DIMENSIONS & CLEARANCES

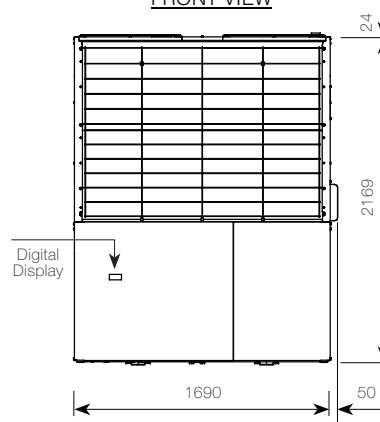
SIDE VIEW



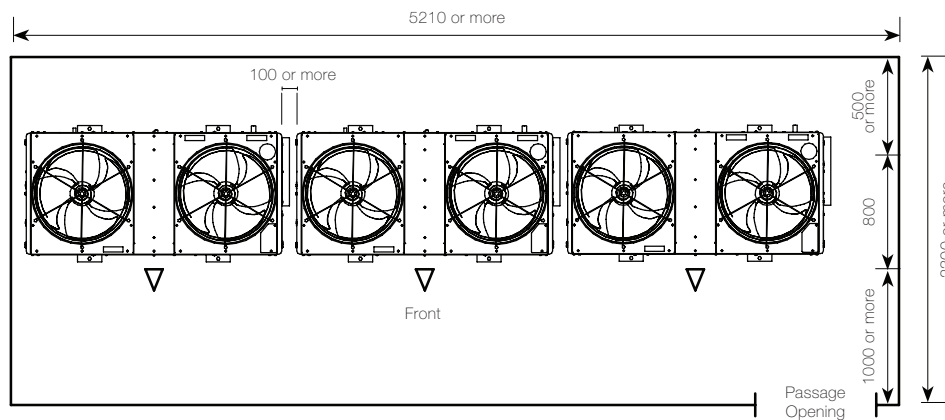
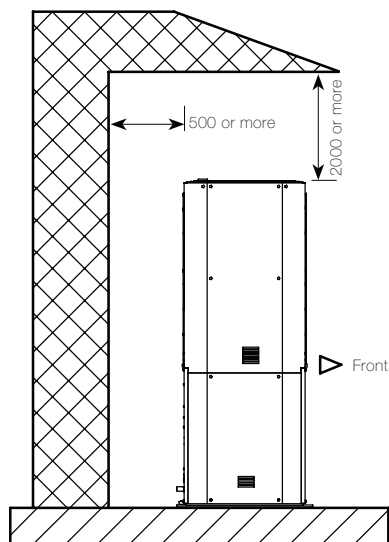
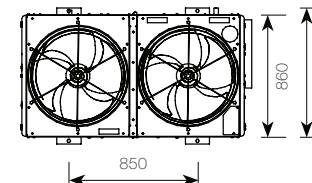
BACK VIEW



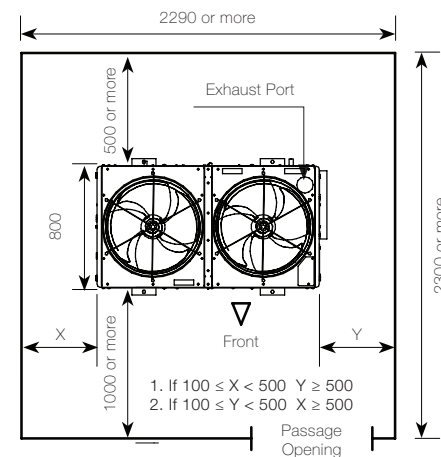
FRONT VIEW



TOP VIEW



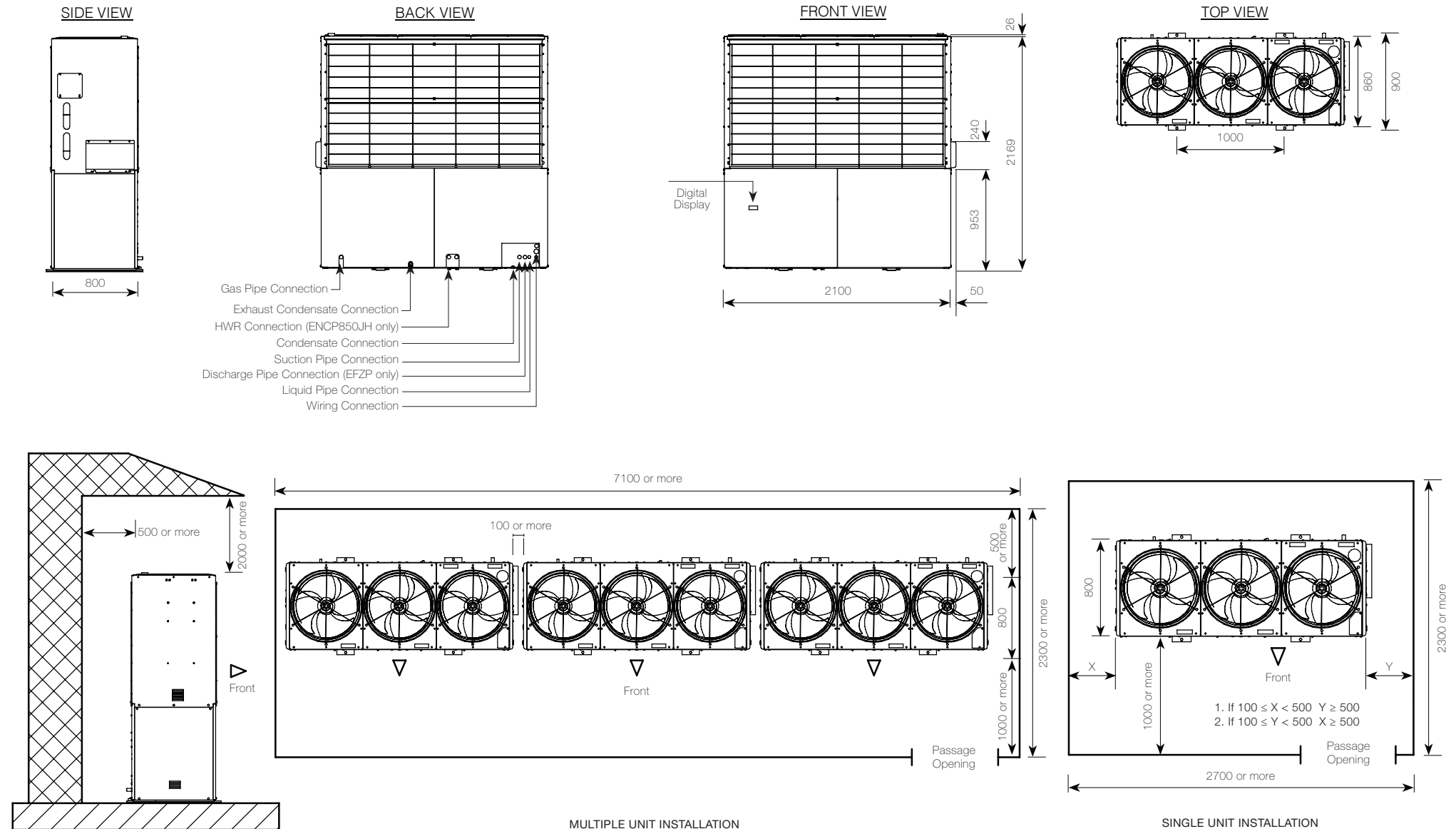
MULTIPLE UNIT INSTALLATION



SINGLE UNIT INSTALLATION

MODELS: **ENCP710J / ENCP850J / ENCP850JH / EFZP850J**

DIMENSIONS & CLEARANCES





Model: **YZCP-PVE**

CASSETTE INDOOR UNIT

- Available in 8 models from 2.8kW to 14.0kW
- Round flow design for even air distribution
- DC Motor for improved energy efficiency
- Condensate lift pump and drain safety switch
- Various louver settings
- Fresh air intake option (up to 20 %)



Technical Data

Item/Model		YZCP28PVE	YZCP36PVE	YZCP45PVE	YZCP56PVE
Cooling Capacity (T1)	kW	2.8	3.6	4.5	5.6
Heating Capacity (H1)	kW	3.2	4.0	5.0	6.3
Airflow (L/M/H)	L/s	167/192/217	167/192/217	183/217/250	183/225/267
Sound Pressure (L/M/H)	dB(A)	27/29/30	27/29/30	27/29/31	27/30/32
Power Source	V/Hz/P	220-240/50/1			
Current	FLA	0.2			
Power Input (Cool/Heat)	kW	0.033/0.027		0.047/0.034	0.052/0.038
Unit Dimension (HxWxD)	mm	246x840x840			
Panel Dimension (HxWxD)	mm	50x950x950			
Weight (Panel)	kg	19.5 (5.5)			
Refrigerant Piping	mm	6.4/12.7			
Filter		Resin Net (Mould Resistant)			
Drain Pump		Standard – Lift 700 mm or less from the bottom of the unit			
Drain Piping	mm	VP25 (ID 25 OD 32)			

Item/Model		YZCP71PVE	YZCP90PVE	YZCP112PVE	YZCP140PVE
Cooling Capacity (T1)	kW	7.1	9.0	11.2	14.0
Heating Capacity (H1)	kW	8.0	10.0	12.5	16.0
Airflow (L/M/H)	L/s	225/275/317	250/300/350	333/433/533	375/467/550
Sound Pressure (L/M/H)	dB(A)	28/31/34	31/34/36	32/38/43	34/39/44
Power Source	V/Hz/P	220-240/50/1			
Current	FLA	0.3	0.4	1	1.2
Power Input (Cool/Heat)	kW	0.066/0.053	0.093/0.075	0.187/0.174	0.209/0.200
Unit Dimension (HxWxD)	mm	246x840x840		288x840x840	
Panel Dimension (HxWxD)	mm	50x950x950			
Weight (Panel)	kg	22.0 (5.5)		25.0 (5.5)	
Refrigerant Piping	mm	9.5/15.9			
Filter		Resin Net (Mould Resistant)			
Drain Pump		Standard – Lift 700 mm or less from the bottom of the unit			
Drain Piping	mm	VP25 (ID 25 OD 32)			

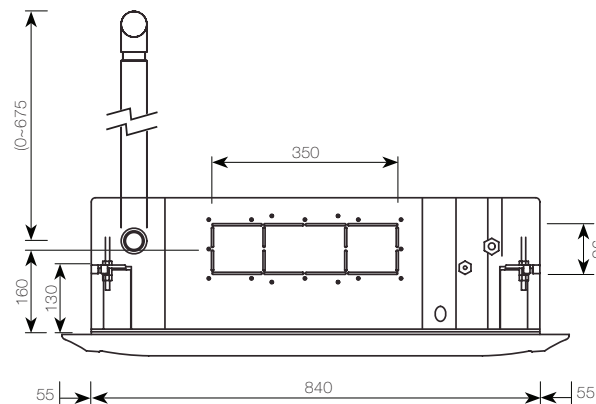
Note 1: Specifications are based on the following conditions;

- ISO T1 Cooling: Indoor temp of 27°CDB, 19.0°CWB, and outdoor temp. of 35.0°CDB.
- ISO H1 Heating: Indoor temp of 20°CDB, and outdoor temp. of 7°CDB, 6°CWB.

Note 2: Actual capacity of indoor unit is based on the system configuration in combination with outdoor unit and correction factors

Note 3: Sound level: Anechoic chamber conversion value, measured at a point 1.5 m downward from the unit centre

DIMENSIONS & CLEARANCES





Model: **YZDP-PVE**
YZDP-MVE

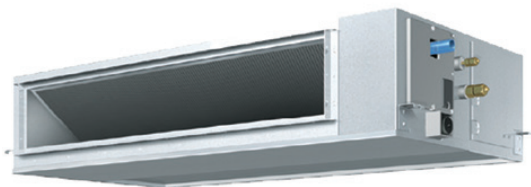
DUCTED INDOOR UNIT

PVE Series

- Available in 10 models from 2.2kW to 16.0kW
- Ideal for all commercial applications
- DC Motor for improved energy efficiency
- Automatic airflow and external static pressure adjustment function
- Condensate lift pump and drain safety switch
- Discretely concealed in the ceiling
- Low operating noise levels

MVE Series

- Available in 2 models, 22.4kW and 28.0kW
- High static pressure



Technical Data

Item/Model		YZDP22PVE	YZDP28PVE	YZDP36PVE	YZDP45PVE	YZDP56PVE	YZDP71PVE
Cooling Capacity (T1)	kW	2.2	2.8	3.6	4.5	5.6	7.1
Heating Capacity (H1)	kW	2.5	3.2	4.0	5.0	6.3	8.0
Airflow (L/M/H)	L/s	108/125/150	108/125/150	116/133/158	183/216/267	250/275/300	267/292/325
External Static Press (Min Rated Max)	Pa	30-50-100	30-50-100	30-50-100	30-100-160	50-100-200	50-100-200
Sound Pressure (L/M/H)	dB(A)	29/31/33	29/31/33	30/32/34	35/37/39	37/39/41	38/40/42
Power Source	V/Hz/ P	220-240/50/1					
Current	FLA				1.4	1.6	1.8
Power Input (Cool/Heat)	kW	0.081/0.069	0.081/0.069	0.085/0.073	0.194/0.182	0.215/0.203	0.23/0.218
Dimension (HxWxD)	mm	300x550x700			300x700x700	300x1000x700	
Weight	kg	25			28	36	
Refrigerant Piping	mm	6.4/12.7					9.5/15.9
Filter		Not Included - Field Supplied					
Drain Pump		Standard – Lift 700 mm or less from the bottom of the unit					
Drain Piping		VP25 (ID 25 OD 32)					

Item/Model		YZDP90PVE	YZDP112PVE	YZDP140PVE	YZDP160PVE	YZDP224MVE	YZDP280MVE
Cooling Capacity (T1)	kW	9.0	11.2	14.0	16.0	22.4	28.0
Heating Capacity (H1)	kW	10.0	12.5	16.0	18.0	25.0	32.5
Airflow (L/M/H)	L/s	333/375/417	383/450/533	466/550/650	533/649/766	833/966	1033/1200
External Static Press (Min Rated Max)	Pa	50-100-200	50-100-200	50-100-200	50-100-140	130-220	190-270
Sound Pressure (L/M/H)	dB(A)	39/41/43	39/41/43	40/42/44	43/45/46	46/49	46/49
Power Source	V/Hz/ P	220-240/50/1					
Current	FLA	2.3	2.9	3.4		6.5	7.2
Power Input (Cool/Heat)	kW	0.298/0.286	0.376/0.364	0.461/0.449	0.461/0.449	1.29/1.29	1.47/1.47
Dimension (HxWxD)	mm	300x1000x700	300x1400x700			470x1380x1100	
Weight	kg	36	46		47	137	137
Refrigerant Piping	mm	9.5/15.9				9.5/19.1	9.5/22.2
Filter		Not Included - Field Supplied					
Drain Pump		Standard – Lift 700 mm or less from the bottom of the unit				Option	
Drain Piping		VP25 (ID 25 OD 32)				PS1B	

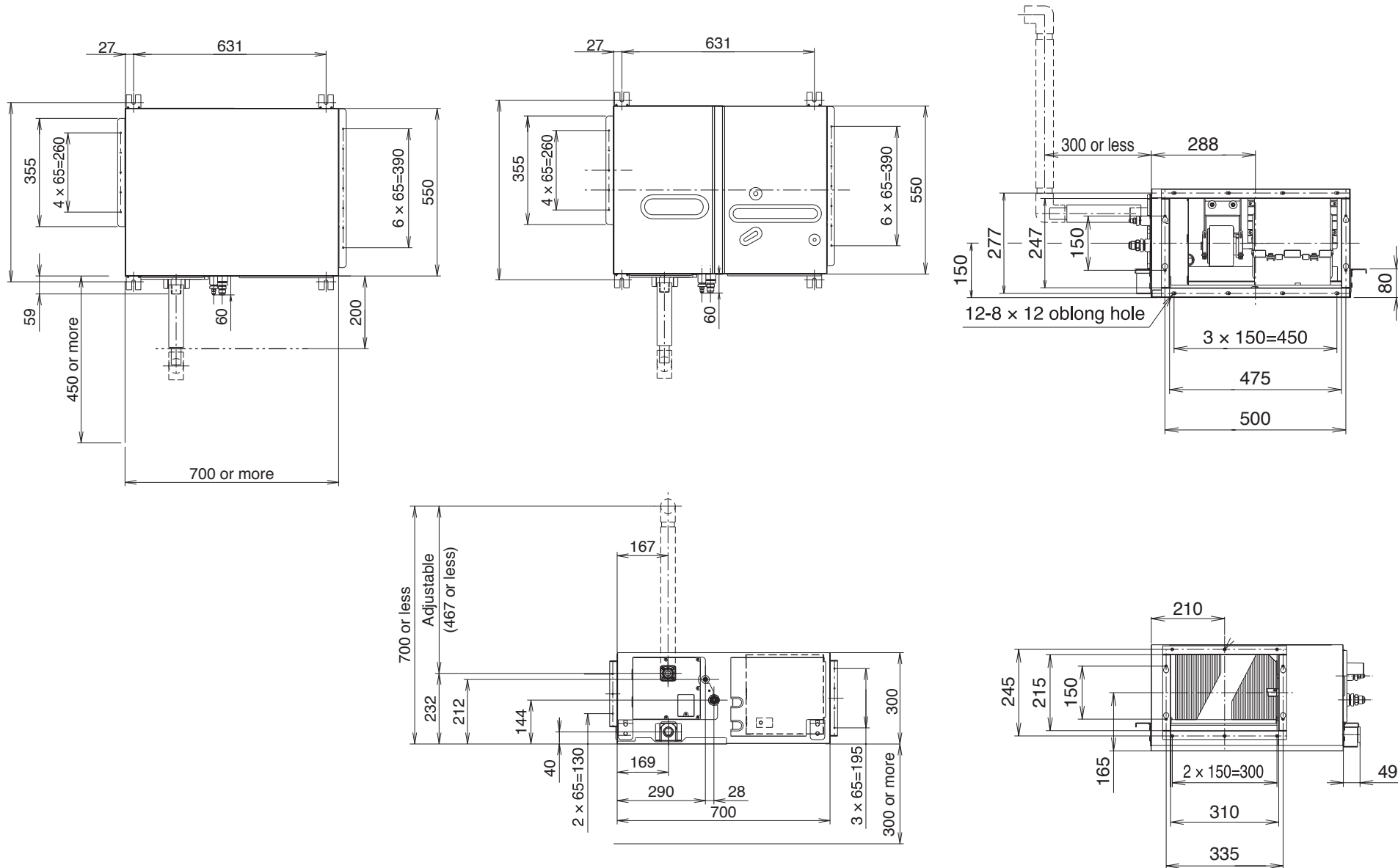
Note 1: Specifications are based on the following conditions;

- ISO T1 Cooling: Indoor temp of 27°CDB, 19.0°CWB, and outdoor temp. of 35.0°CDB.
- ISO H1 Heating: Indoor temp of 20°CDB, and outdoor temp. of 7°CDB, 6°CWB.

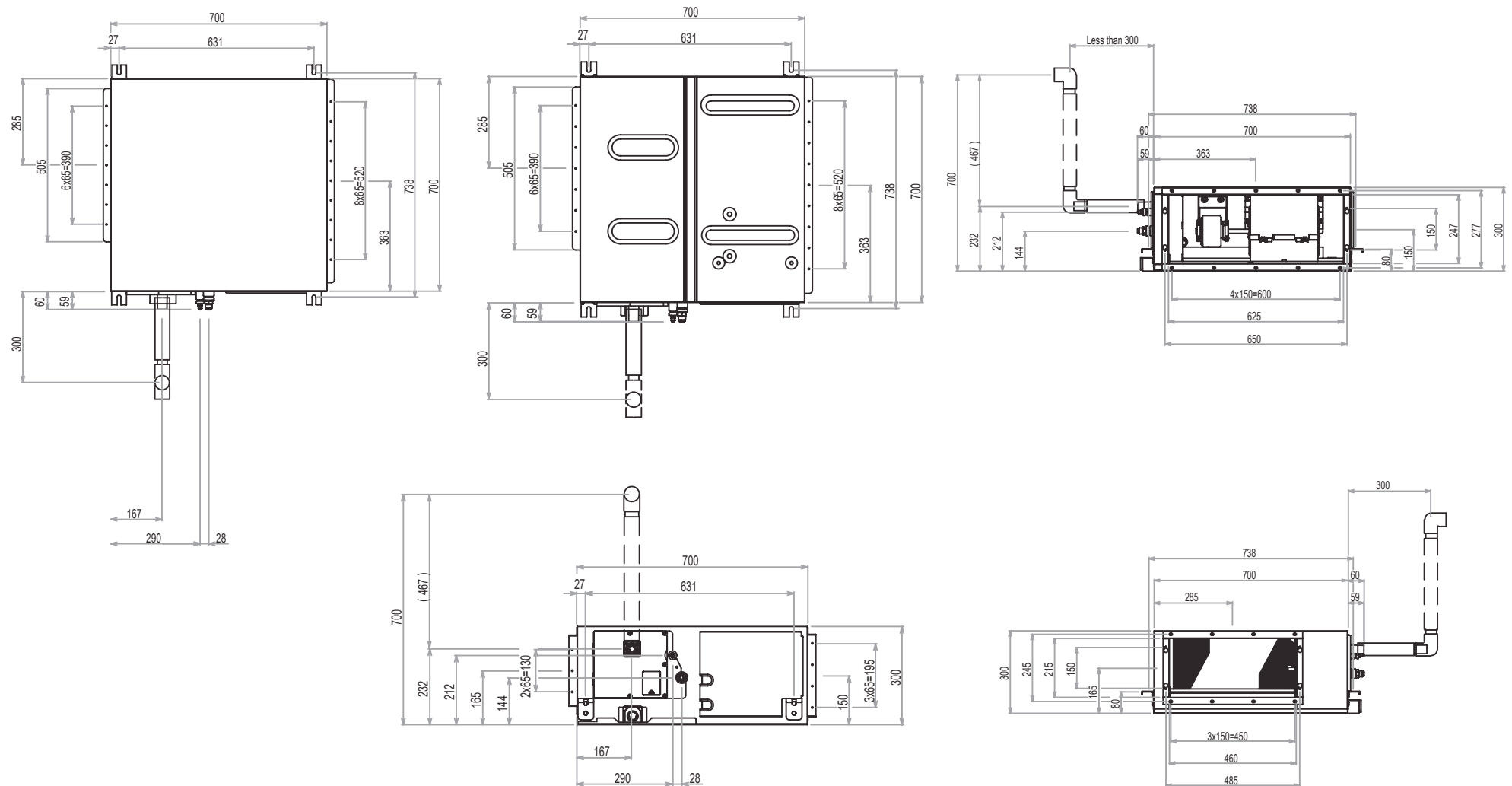
Note 2: Actual capacity of indoor unit is based on the system configuration in combination with outdoor unit and correction factors

Note 3: Sound level: Anechoic chamber conversion value, measured at a point 1.5 m downward from the unit centre

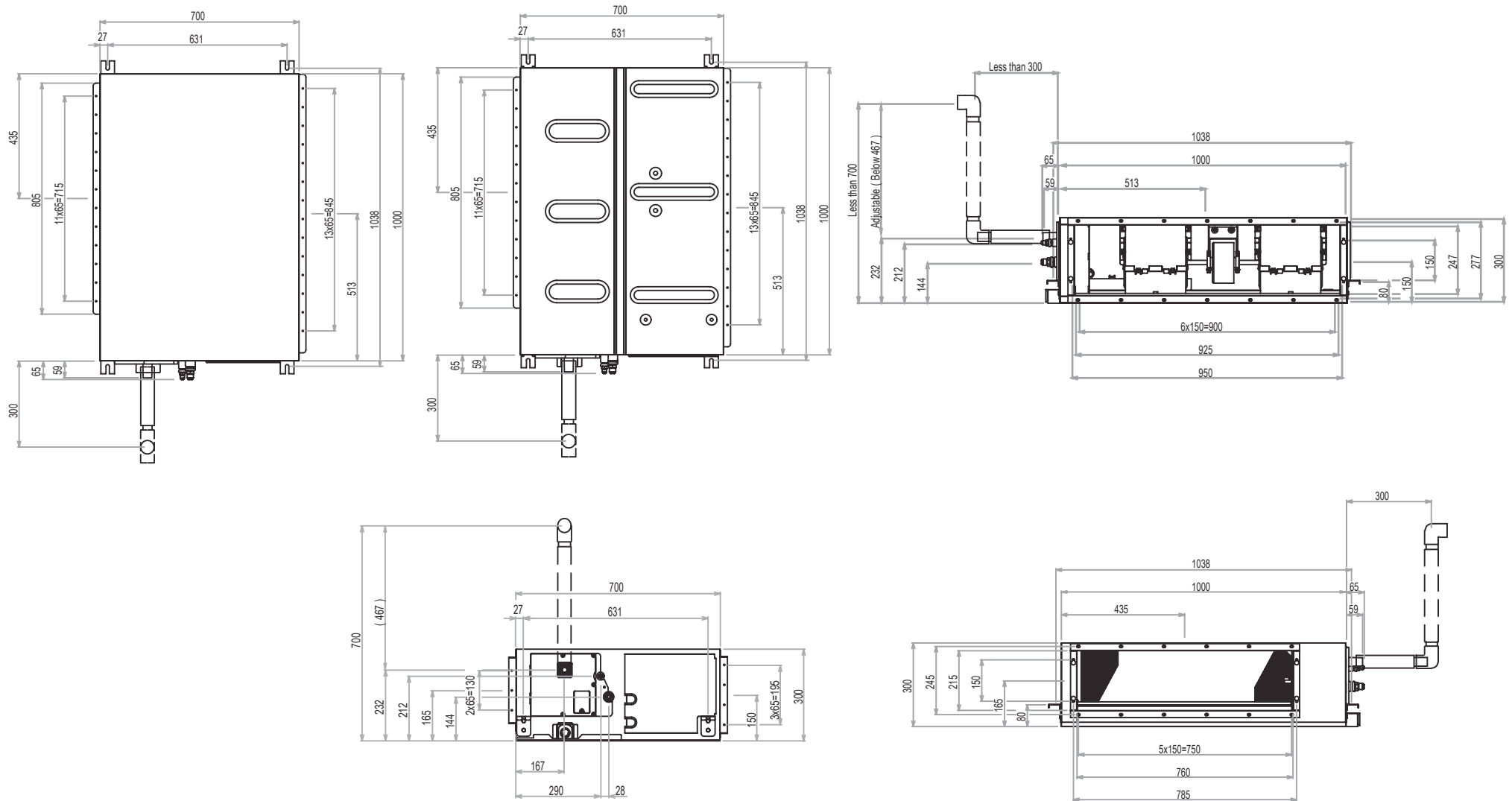
Model: **YZDP22PVE / YZDP28PVE / YZDP36PVE**



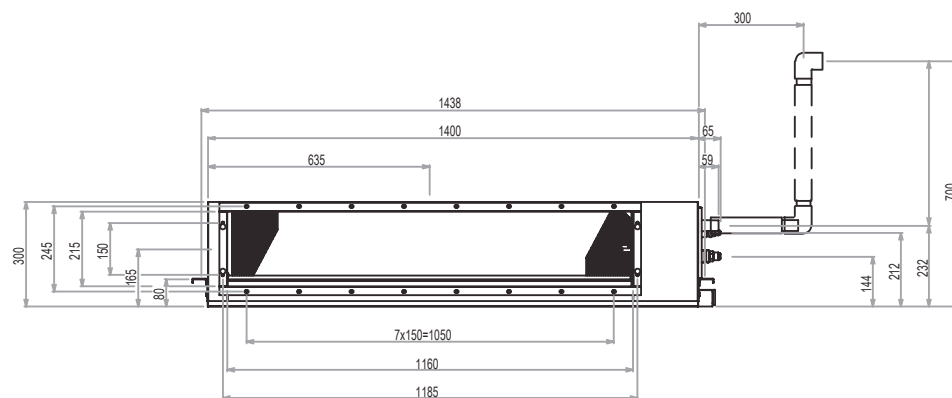
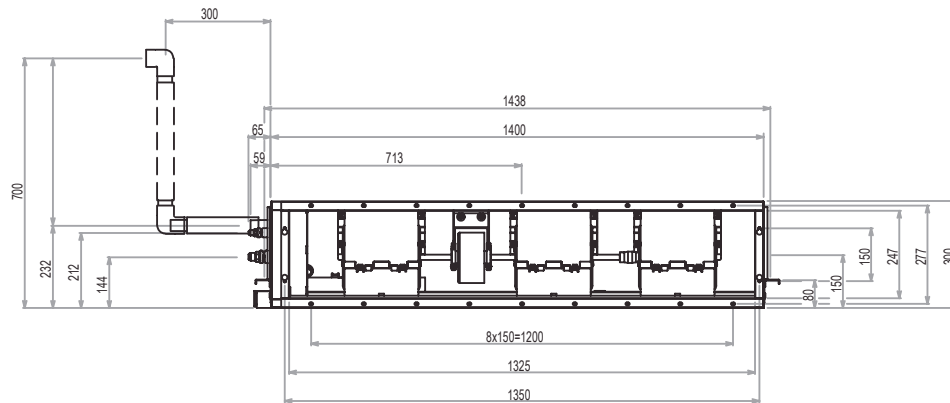
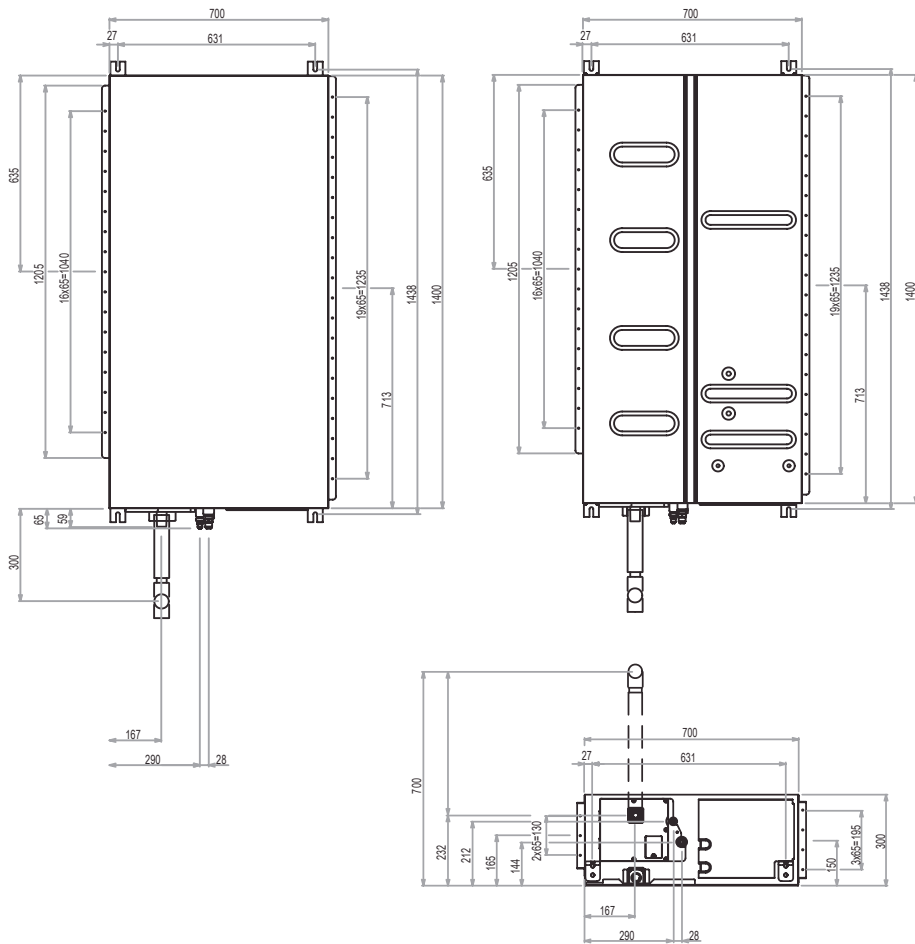
Model: **YZDP45PVE**



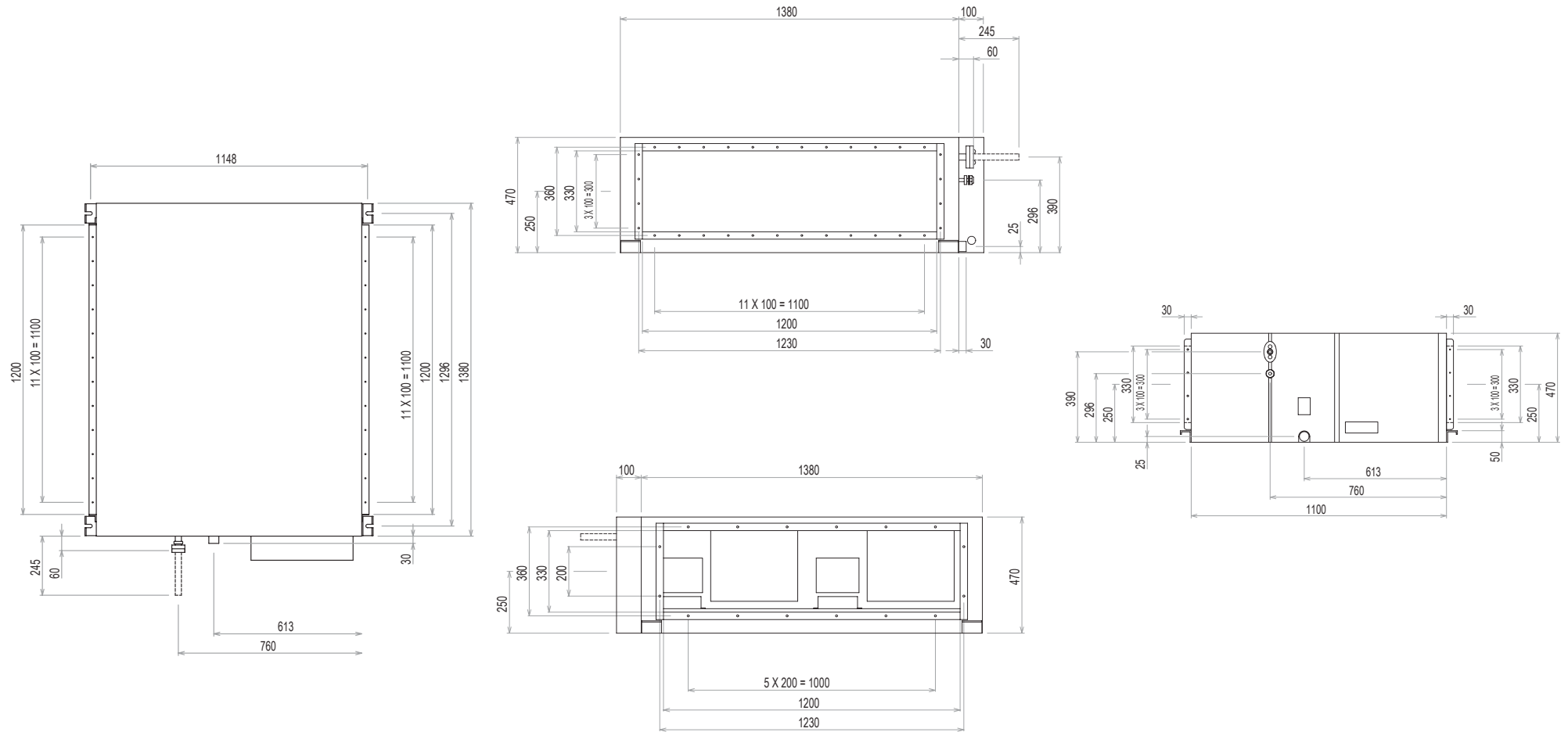
Model: **YZDP56PVE / YZDP71PVE / YZDP90PVE**



Model: **YZDP112PVE / YZDP140PVE / YZDP160PVE**



Model: **YZDP224MVE / YZDP280MVE**





Model: **YZSDP-PBVE**

SLIM DUCTED INDOOR UNIT

- Available in 6 models from 2.2kW to 7.1kW
- Ideal for small offices and residences
- Adjustable air intake connection (rear or bottom)
- DC Motor for improved energy efficiency
- Condensate lift pump and drain safety switch
- Discretely concealed in the ceiling
- Low operating noise levels

Technical Data

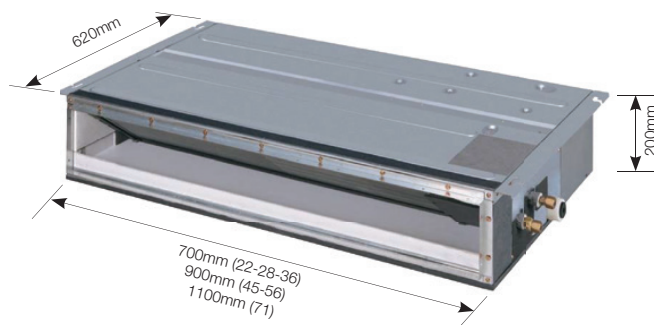
Item/Model		YZSDP22PBVE	YZSDP28PBVE	YZSDP36PBVE	YZSDP45PBVE	YZSDP56PBVE	YZSDP71PBVE
Cooling Capacity (T1)	kW	2.2	2.8	3.6	4.5	5.6	7.1
Heating Capacity (H1)	kW	2.5	3.2	4.0	5.0	6.3	8.0
Airflow (L/M/H)	L/s	106/120/133			142/158/175	167/183/208	217/241/275
External Static Press (Rated Max)	Pa	10/30			15/45		
Sound Pressure (L/M/H)	dB(A)	29/31/33			30/32/34	31/33/35	32/34/36
Power Source	V/Hz/ P	220-240/50/1					
Current	FLA	0.6			0.8		0.9
Power Input (Cool/Heat)	kW	0.067/0.067		0.07/0.07	0.15/0.15		0.17/0.17
Dimension (HxWxD)	mm	200x700x620			200x900x620		200x1100x620
Weight	kg	23			27	28	31
Refrigerant Piping	mm	6.4/12.7					9.5/15.9
Filter		Removal/Washable/Mildew Proof					
Drain Pump		Standard – Lift 700 mm or less from the bottom of the unit					
Drain Piping		VP20 (ID 20 OD 26)					

Note 1: Specifications are based on the following conditions;

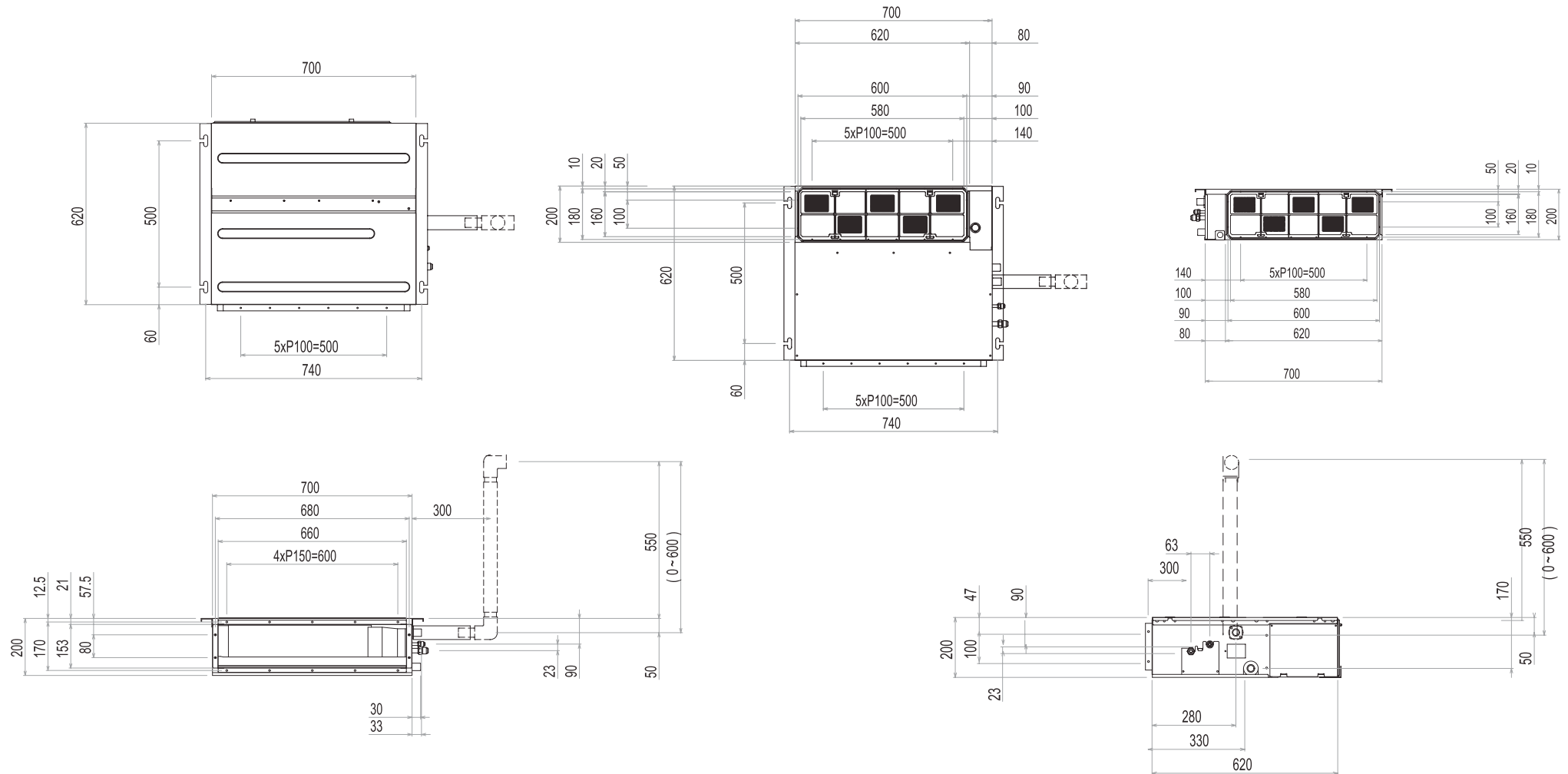
- ISO T1 Cooling: Indoor temp of 27°CDB, 19.0°CWB, and outdoor temp. of 35.0°CDB.
- ISO H1 Heating: Indoor temp of 20°CDB, and outdoor temp. of 7°CDB, 6°CWB.

Note 2: Actual capacity of indoor unit is based on the system configuration in combination with outdoor unit and correction factors

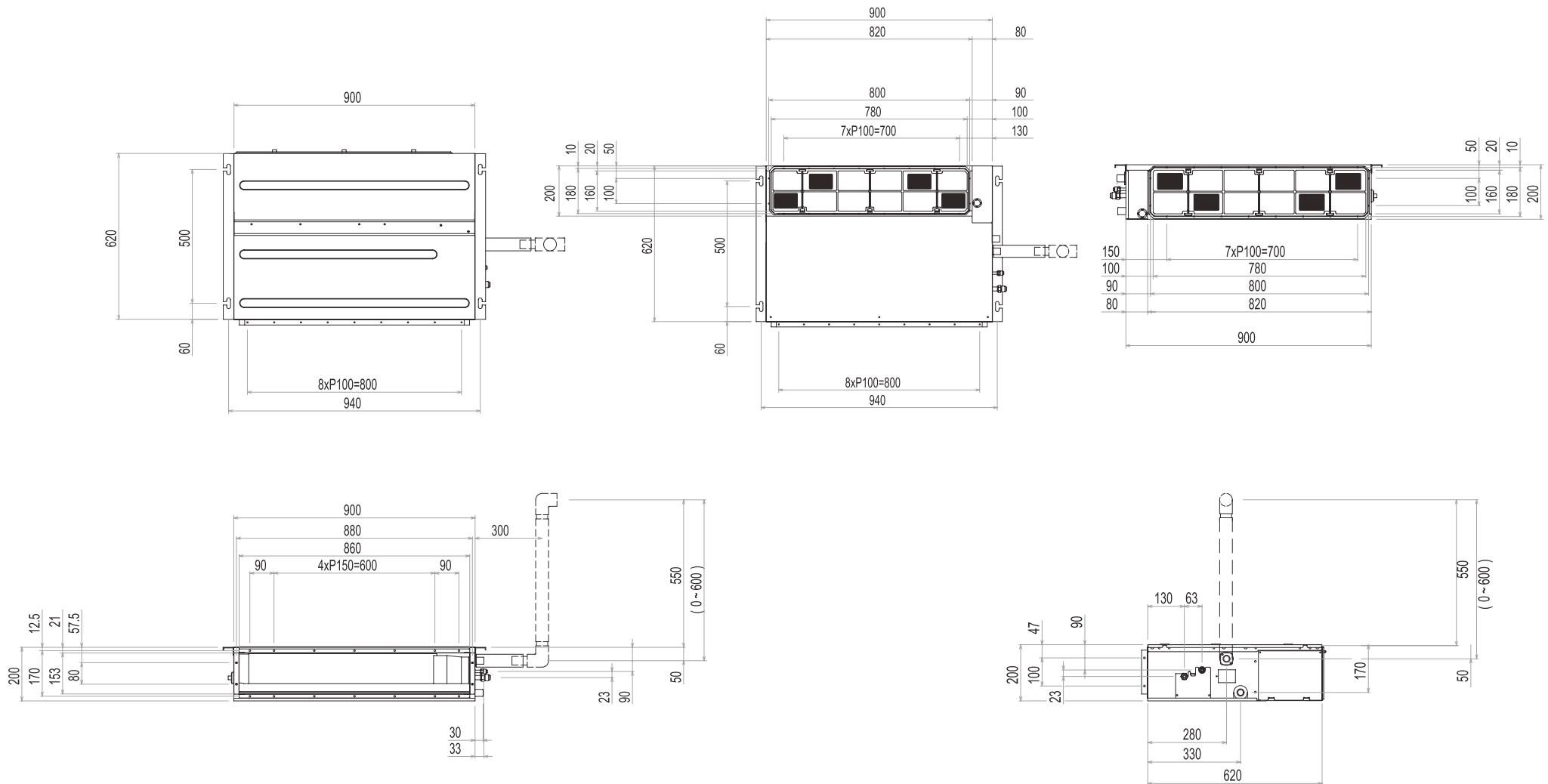
Note 3: Sound level: Anechoic chamber conversion value, measured at a point 1.5 m downward from the unit centre



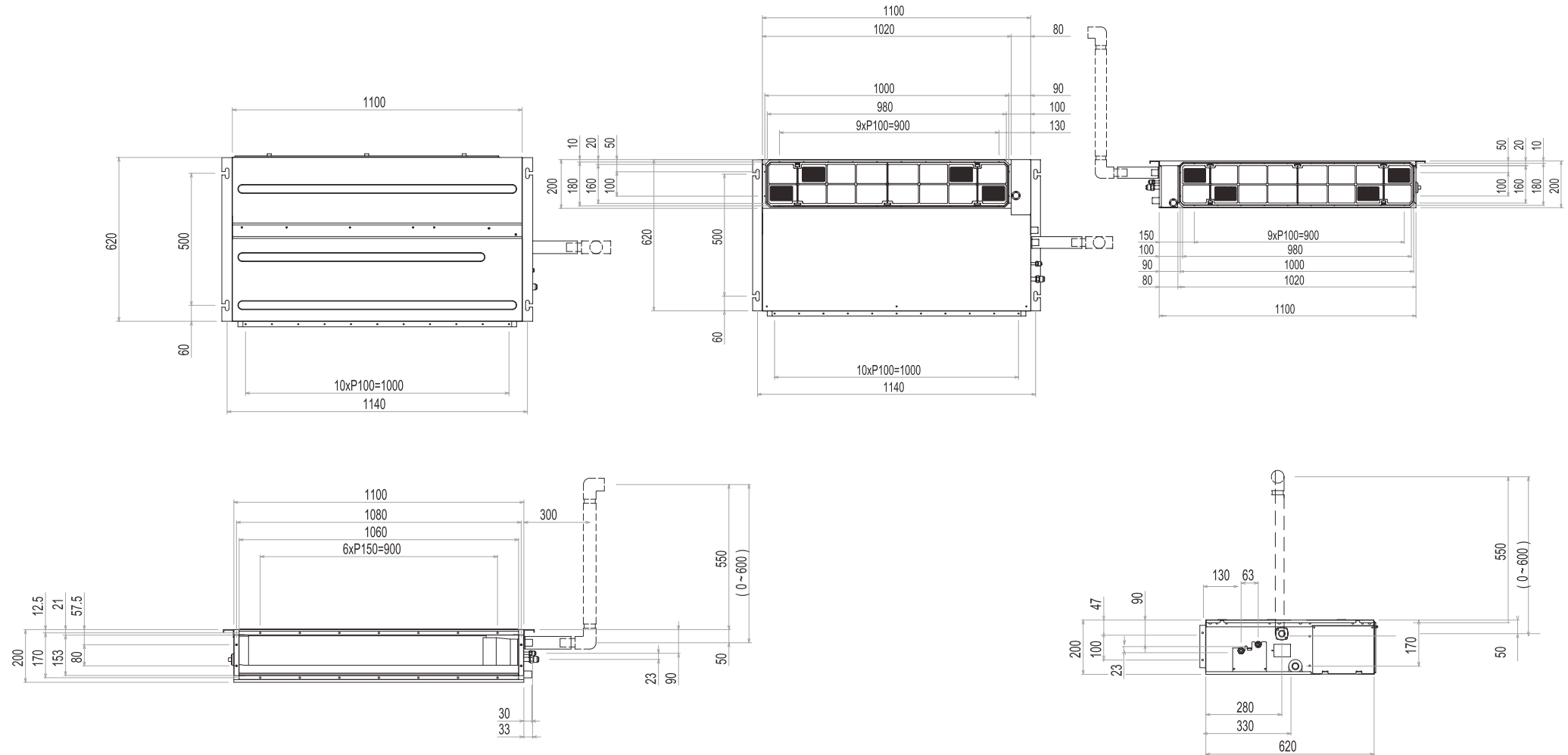
Model: **YZSDP22PBVE / YZSDP28PBVE / YZSDP36PBVE**



Model: **YZSDP45PBVE / YZSDP56PBVE**



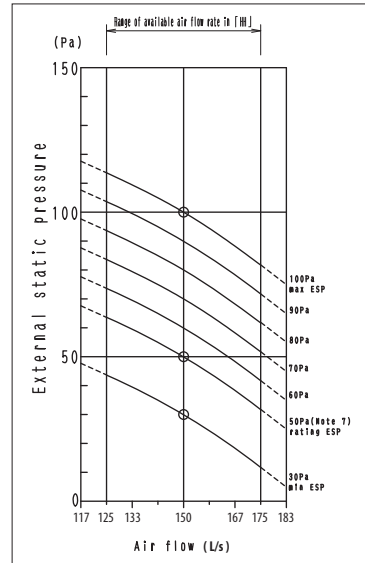
Model: **YZSDP71PBVE**



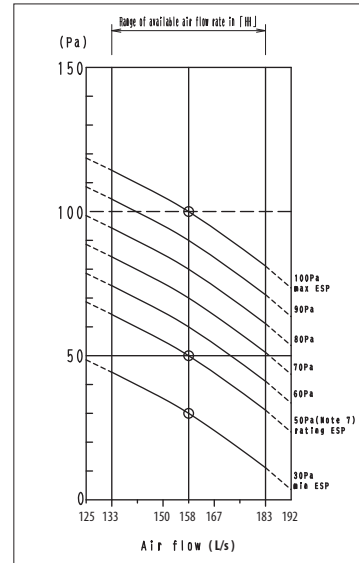
FAN PERFORMANCE

YZDP-PVE

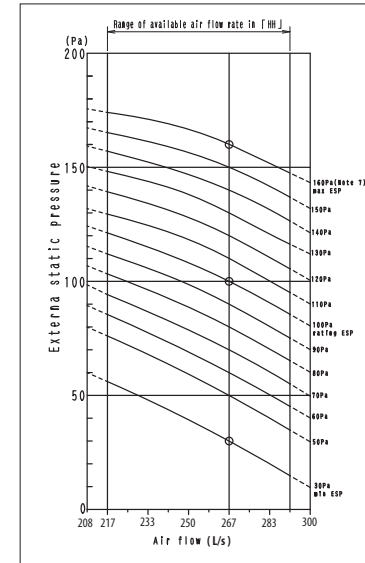
YZDP22/28PVE



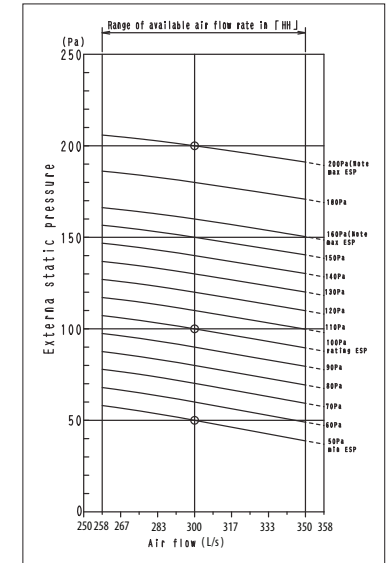
YZDP36PVE



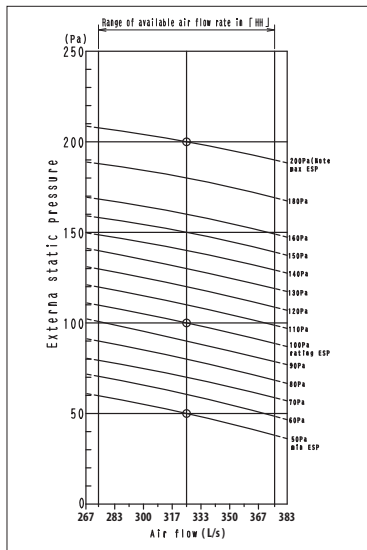
YZDP45PVE



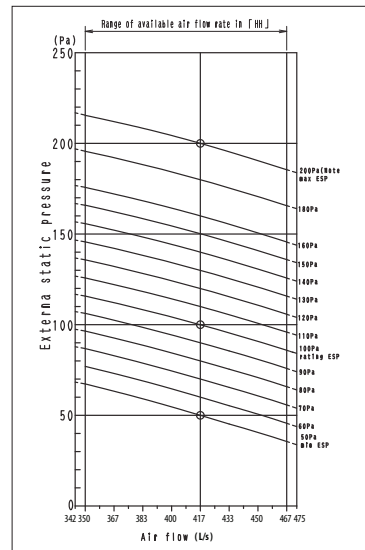
YZDP56PVE



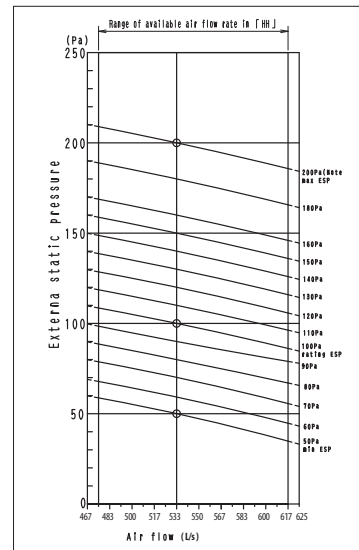
YZDP71PVE



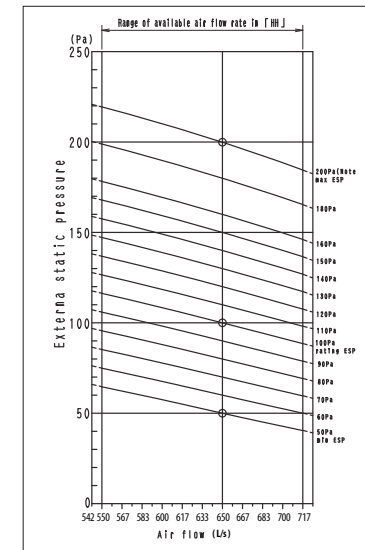
YZDP90PVE



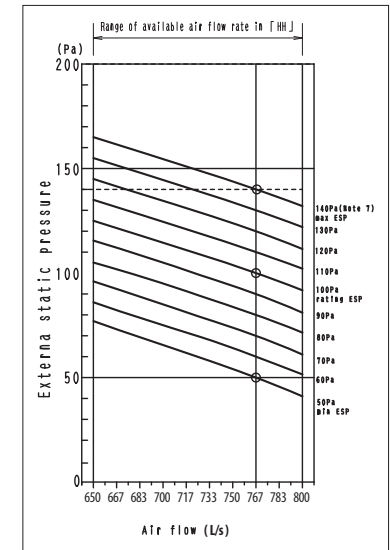
YZDP112PVE



YZDP140PVE

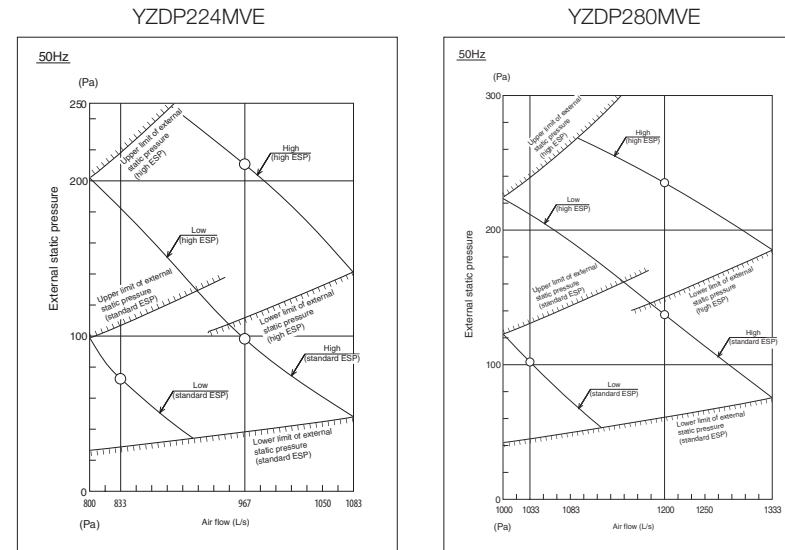


YZDP160PVE

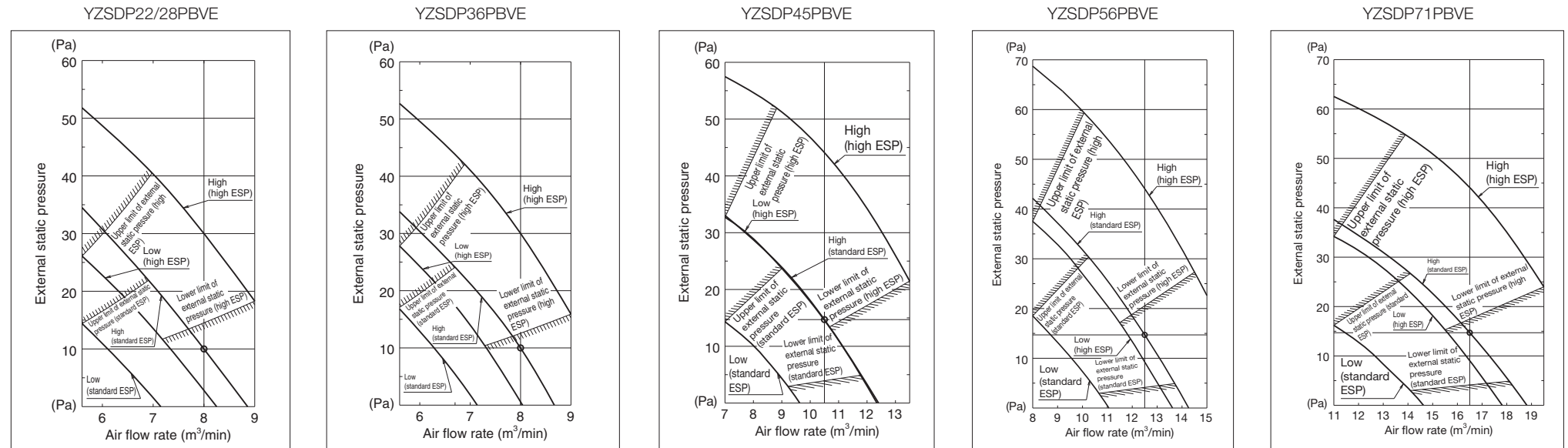


FAN PERFORMANCE

YZDP-MVE



YZSDP-PBVE





Model: **YZAP-PVE**

WALL MOUNTED INDOOR UNIT

- Available in 6 models from 2.2kW to 7.1kW
- Flat and stylish front panel to suit any interior décor
- DC Motor for improved energy efficiency
- Various louvre discharge angle settings
- Easy to clean and maintain



Technical Data

Item/Model		YZAP22PVE	YZAP28PVE	YZAP36PVE	YZAP45PVE	YZAP56PVE	YZAP71PVE
Cooling Capacity (T1)	kW	2.2	2.8	3.6	4.5	5.6	7.1
Heating Capacity (H1)	kW	2.5	3.2	4.0	5.0	6.3	8.0
Airflow (L/H)	L/s	75/125	83/133	91/150	150/200	200/250	233/316
Sound Pressure (L/H)	dB(A)	29/35	29/36	29/37	34/39	36/42	39/46
Power Source	V/Hz/ P	220-240/50/1					
Current	FLA	0.3	0.4	0.4	0.4	0.4	0.6
Power Input (Cool/Heat)	kW	0.019/0.029	0.028/0.034	0.030/0.035	0.020/0.020	0.033/0.039	0.050/0.060
Dimension (HxWxD)	mm	290x795x238			290x1050x238		
Weight	kg	11			14		
Refrigerant Piping	mm	6.4/12.7					9.5/15.9
Filter		Removal/Washable/Mildew Proof					
Drain Piping		VP13 (ID 13 OD 18)					

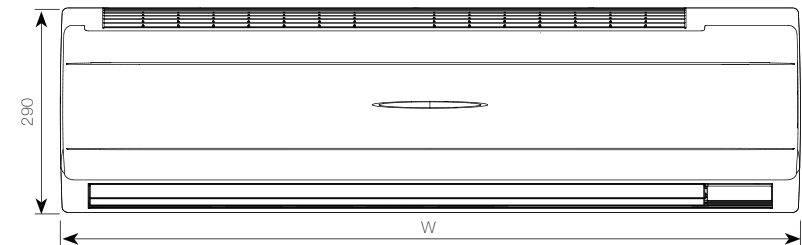
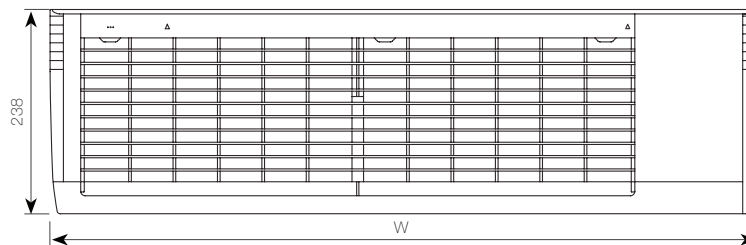
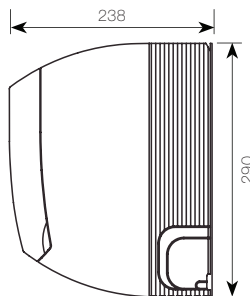
Note 1: Specifications are based on the following conditions;

- ISO T1 Cooling: Indoor temp of 27°CDB, 19.0°CWB, and outdoor temp. of 35.0°CDB.
- ISO H1 Heating: Indoor temp of 20°CDB, and outdoor temp. of 7°CDB, 6°CWB.

Note 2: Actual capacity of indoor unit is based on the system configuration in combination with outdoor unit and correction factors

Note 3: Sound level: Anechoic chamber conversion value, measured at a point 1.5 m downward from the unit centre

Models: **YZAP22-36PVE** [Dimension W = 795]
YZAP45-71PVE [Dimension W = 1050]





Model: **YZHP36-112MAVE**

UNDER CEILING INDOOR UNIT

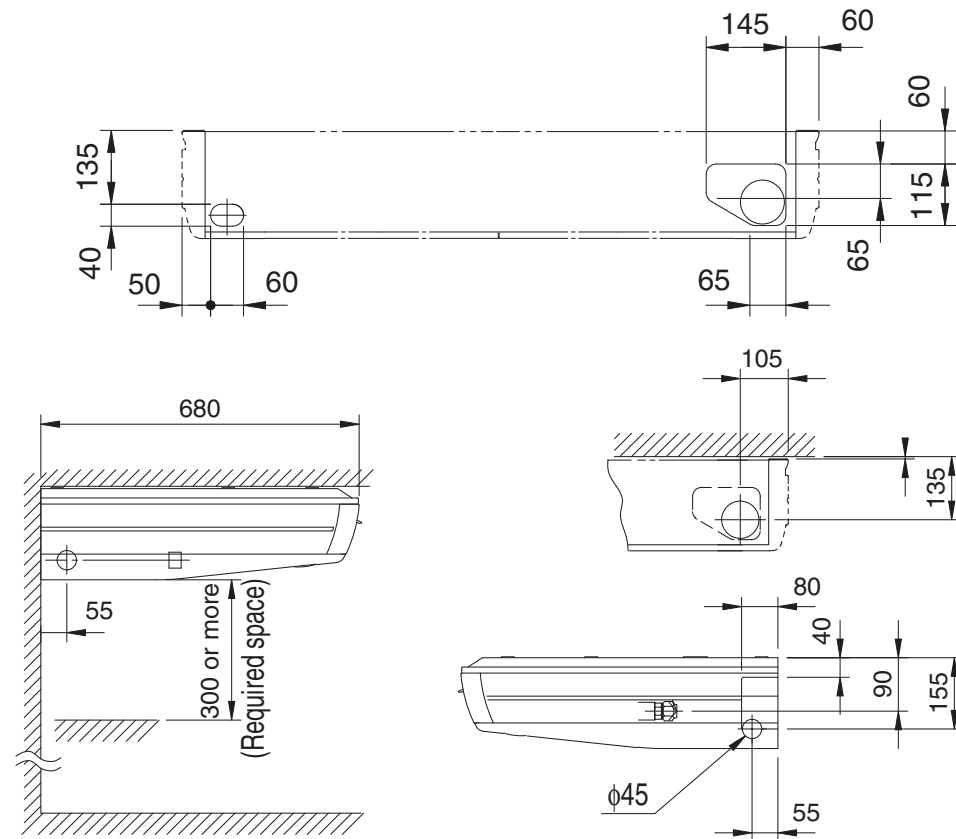
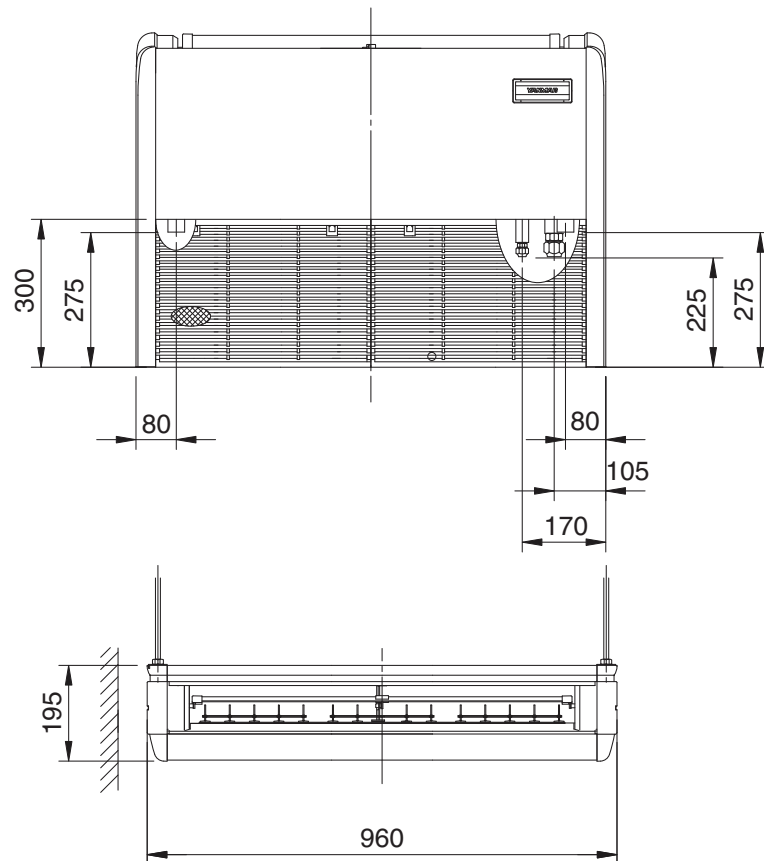
- Available in 3 models from 3.6kW, 7.1kW and 11.2kW
- Ideal solution for commercial spaces with solid ceilings
- DC Motor for improved energy efficiency
- Various louver discharge angle settings
- Fresh air intake option (up to 20 %)

Technical Data

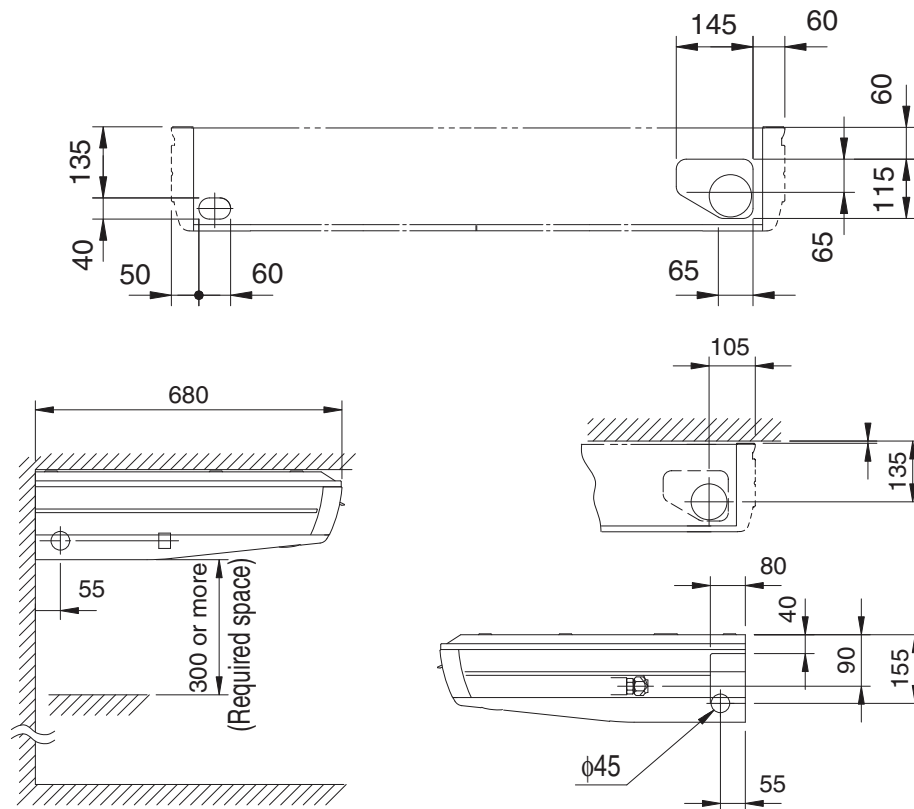
Item/Model		YZHP36MAVE	YZHP71MAVE	YZHP112MAVE
Cooling Capacity (T1)	kW	3.6	7.1	11.2
Heating Capacity (H1)	kW	4	8	12.5
Airflow (L/H)	L/s	166/200	233/291	325/416
Sound Pressure (L/H1/36)	dB(A)	31/36	34/39	37 45
Power Source	V/Hz/ P	220-240/50/1		
Current	FLA	0.6	0.6	0.7
Power Input (Cool/Heat)	kW	0.111/0.111	0.115/0.115	0.135/0.135
Dimension (HxWxD)	mm	195x960x680	195x1160x680	195x1400x680
Weight	kg	24	28	33
Refrigerant Piping	mm	6.4/12.7	9.5/15.9	
Filter		Removal/Washable/Mildew Proof		
Drain Piping		VP20 (ID 20 OD 26)		



Model: **YZHP36MAVE**



YANMAR ENERGY AUSTRALIA PRODUCT CATALOGUE

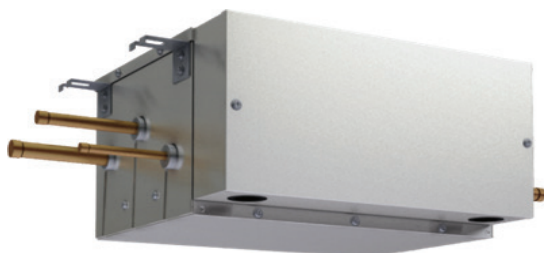




Model: **YBSVP-PV1**

BS UNIT

The **YBSVP** branch selector box provides connection to the EFZP series of outdoor unit to permit simultaneous cooling and heating operations.



Technical Data

Model name				YBSVP112PV1	YBSVP180PV1	YBSVP280PV1
Power supply			V/Hz/P	220-240/50/1		
Running current			(A)	0.1		
Rated power consumption			(kW)	0.005		
Total capacity of connectable indoor units (Q)			(kW)	Q ≤ 11.2	11.2 < Q ≤ 18.0	18.0<Q≤28.0
Min. capacity of connectable indoor unit			(kW)	2.2		
Max. number of connectable indoor units			(unit)	5	8	8
Refrigerant piping	Indoor unit	Liquid	(mm)	9.5	9.5	9.5
		Gas	(mm)	15.9	15.9	22.2
	Outdoor unit	Liquid	(mm)	9.5	9.5	9.5
		Gas	(mm)	15.9	15.9	22.2
		Discharge	(mm)	12.7	12.7	19.1
Sound Pressure			dB(A)	42	43	44
Acoustic insulation				Polystyrene foam, Flame resistant felt		
Dimensions		HxWxD	(mm)	207x388x326		
Weight			(kg)	12.5		16

Note 1: The flow of refrigerant through the BS unit can create refrigerant noises. Do not install the BS unit in noise-sensitive areas.

Note 2: The control box can be rotated to fix on either side of the BS unit, ensure space for service is provided.

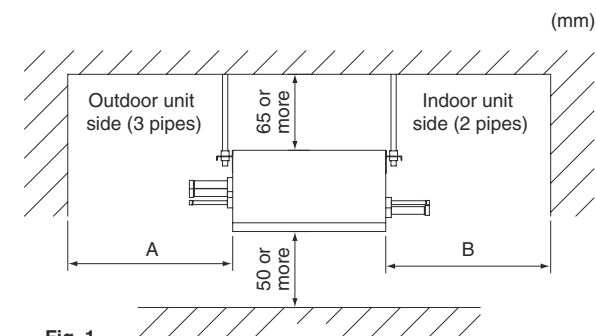
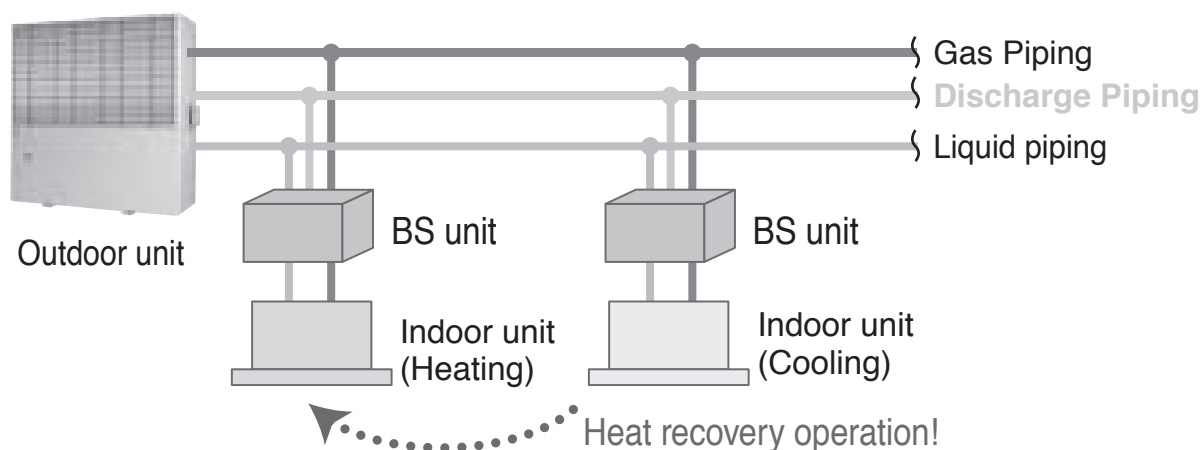


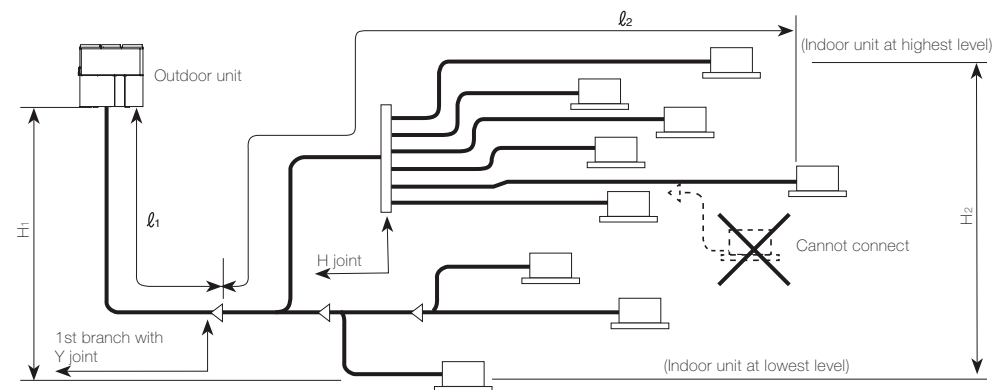
Fig. 1

BS Unit Name	A	B
YBSVP112PV1	250 or more	250 or more (*1)
YBSVP180PV1	250 or more	250 or more
YBSVP280PV1	300 or more (*2)	300 or more (*2)

Refrigerant Piping

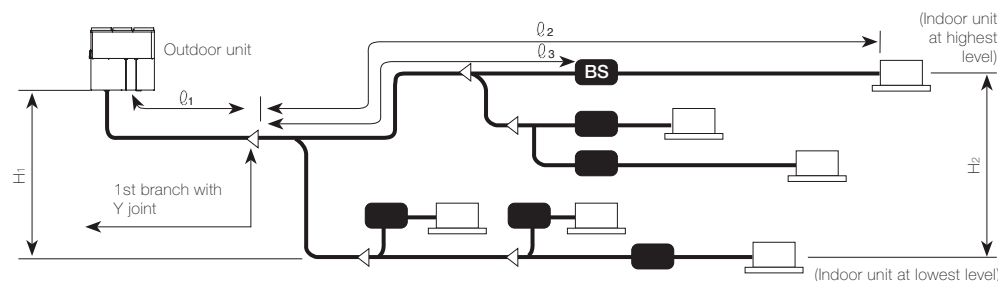
Model			140/180	224-850
Maximum Piping Length (m)	From the outdoor unit to the first branch	L1		130
	From first branch to indoor unit	L2	20	90
	From first branch to BS unit	L3	--	60
	From the outdoor unit to the furthest indoor unit	L1 + L2	60	170
Maximum Height Difference (m)	Between outdoor & indoor units	H1	30	50
	Between each indoor unit/BS unit	H2	15	15
Total Piping Length (m)			100	640
Note 1: If the length after the first branch exceeds 40m, calculate the elevation difference limitation from the diagrams below				
Note 2: No re-branching is allowed after a header kit.				

Refrigerant branching with Y Joints and H Joints



Note: No rebranching is allowed after the H joint. P280 type or larger units can not be connected after the H joint.

Refrigerant branching with Y Joints



Operating Range

Cooling Operation	
Indoor temperature / humidity	18 to 30 °CDB / 80% or less (Can be operated at 30 to 34 °CDB for pull-down)
Outdoor suction temperature	0 to 43 °CDB (- 10 to 43 °CDB with the optional air guard)
Heating Operation	
Indoor temperature	15 to 30 °CDB (Can Operate at 5-15 °C for Preheat)
Outdoor suction temperature	Unit model for general district: - 10 to 35 °CDB Unit model for cold district: - 20 to 35 °CDB (Some operations are partially limited to use at 26 to 35 °CDB)



Yanmar's Gas Powered VRF Multi system has a wide range of proprietary and open control systems to offer building owners and occupiers the ability to control, monitor and schedule operation easily.

An air conditioning system will only operate as efficiently as its control system permits. In buildings with multiple indoor units, system efficiency plays an essential role in reduced energy consumption.

VRF CONTROLS





VRF CONTROLS



Control Overview

Model		LC1E62	LS302C61	LT301B61	LCMS Net	DCS601C51	DCM601A51	DMS502B51	DMS502B51 / LV256B2
Item	Description	Wired Remote Controller	Central Controller	Schedule Timer	Advanced Multi Use Controller	Intelligent Touch Controller	Intelligent Touch Manager	BACnet Interface	AC Manager
Max. No of Indoor Units	Address: 1-00 ~ 4-15	1~16	1~64	1~64	1~128	1~128	1~512	1~256	1~256
Max. No of DIII Networks	Adaptors may be required	--	1	1	2	2	8	4	4
Control	On/Off	●	●	●	●	●	●	○	●
	Set Temperature	●	●		●	●	●	○	●
	Mode (Cool Heat Fan Auto)	●	●		●	●	●	○	●
	Fan Speed (Low Med High)	●	●		●	●	●	○	●
	Louver Swing	●	●		●	●	●	○	●
Monitoring	On/Off Status	●	●		●	●	●	○	●
	Mode Status	●	●		●	●	●	○	●
	Fan Status	●	●		●	●	●	○	●
	Swing Status	●	●		●	●	●	○	●
	Filter inspection	●	●		●	●	●	○	●
	Alarm / Error Status	●	●		●	●	●	○	●
Timer	Run On Timer	■				●	●	○	
	7 Day Timer	■		●	●	●	●	○	●
	Yearly Timer					●	●	○	●
Automatic Control & Management	Grouping/ Zoning		●	●	△	●	●	○	●
	Set Point Restriction	■			●	●	●	○	●
	Permission & Prohibition	●			●	●	●	○	●
	Password Security					●	●	○	
	Automated Heat/Cool Change-over					●	●	○	
	Interactive Floor Plan Display						●	○	
	Error messages via e-mail				●		●	○	
	Optimum start						●	○	
	Interlock Control Setting					●	●	○	
	All Stop Digital Input		●		●	●	●	●	●
	All Start Digital Input				●			○	
Operation Data	Indoor Units	●			●				
PC Connection	RS232C				●				●
WEB Access	Internet Connection				●		●	○	
BMS	BACnet IP				○			●	
Di Dio Ai Controllers	Digital Input / Output		△	△	△	●	●		△
EPD	Energy Proportional Distribution							●	●

■ Not available when combined with a central control device ○ Possible with 3rd party control system △ Limited Control



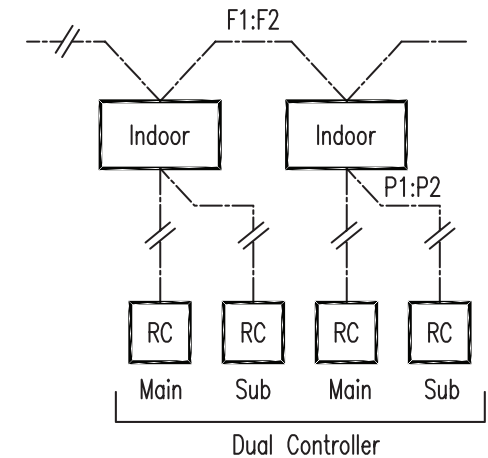
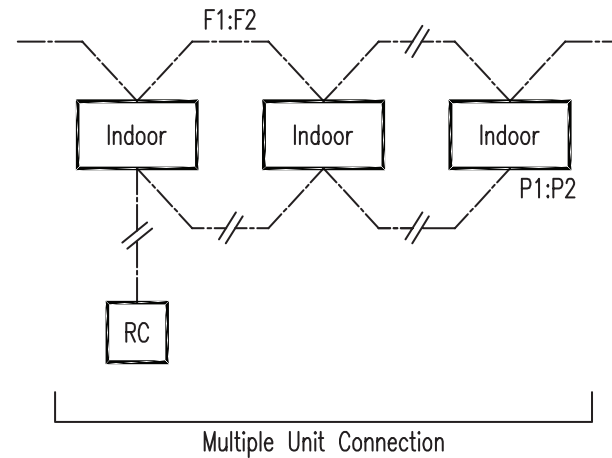
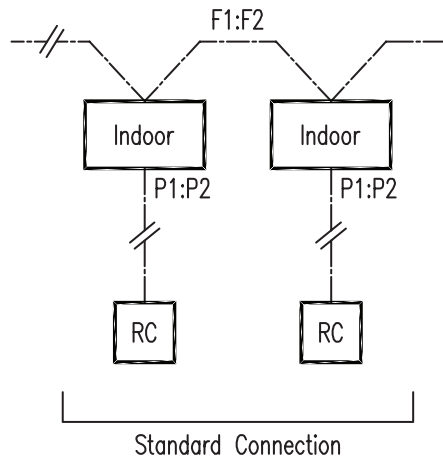
VRF CONTROLS

LC1E62 - Remote Controller

The LC1E62 provides the occupant control and monitoring of their own individual environment.

LC1E62 Specification		
Dimension HxWxD (mm)		120 × 120 × 19
LCD	Display size HxW (mm)	45.4 × 71.4
	Display method	Full dot 160 × 255
	Backlight	White
Color		Fresh White
Connection terminal		P1 : P2
No of Indoor Unit		1 ~ 16
Voltage		12VDC
Wire Type		Shielded Cable 2 Core
Wiring Size		0.75 ~ 1.25mm ²
Wiring Length		500m
Environment (Avoid direct sunlight / air discharge)		0°C to 40°C < 85% RH

Field Code Settings				
Item	Code	1	2	3
DIII Address	00	1-00-4-15		
Temperature Sensor	20-2	Don't Use	Indoor Unit	Remote Controller
Auto Fan Static for YZDP	21-7	Disabled	Adjust Complete	Start Auto Adjust
T1:T2 Input	22-1	Forced Off	On/Off	Indoor safety
Thermostat differential	22-2	1°C	0.5°C	
Fan Speed Heating Thermo Off	22-3	Low	Set	Off
Reset after power failure	22-5	Disabled	Enabled	
Fan Speed Cooling Thermo Off	22-6	Low	Set	
Fixed Heat Cool Master	22-9	Disabled	Enabled	
Fan Static manual setting for YZDP	23-6	0~15 Various steps		
Fan Static for YZSDP	23-9	10Pa	30Pa	





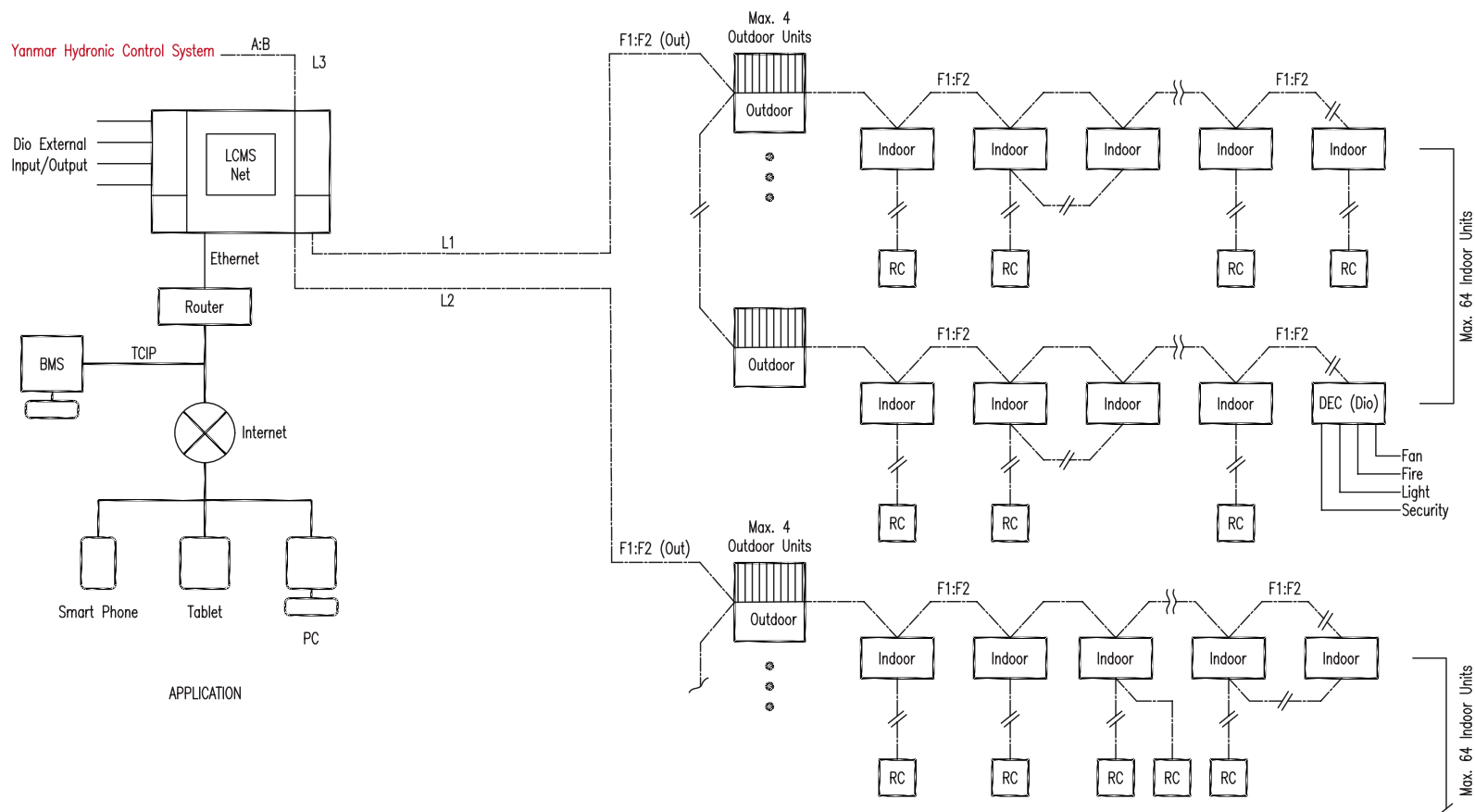
VRF CONTROLS



LCMS Net - Advanced Multi Use Controller

The LCMS Net is a web-based control solution that enables building owners and users to control and monitor Yanmar's VRF indoor units from fixed location or mobile platforms e.g. smart phones, tablets and PCs. BMS connection is also possible to make this control solution our most advanced multi use controller.

Specification	
Model Name	Advanced Multi Use Controller (LCMS Net)
Power Source	Externally supplied 12VDC or Power Adaptor 220–240 VAC 50Hz (Included)
Dimensions (WxHxD)	156 x 90 x 35 [mm]
LCD Display (Size / # of dots / # of colours)	2.8" / 240 x 320 / 262K
Connection terminal (D3)	F1 : F2
Max No of Indoor / Outdoor Units (L1)	64 / 4 (Option L2)
Environment (Avoid direct sunlight)	-10°C ~ 60°C < 95% RH
Mounting	DIN rail / wall





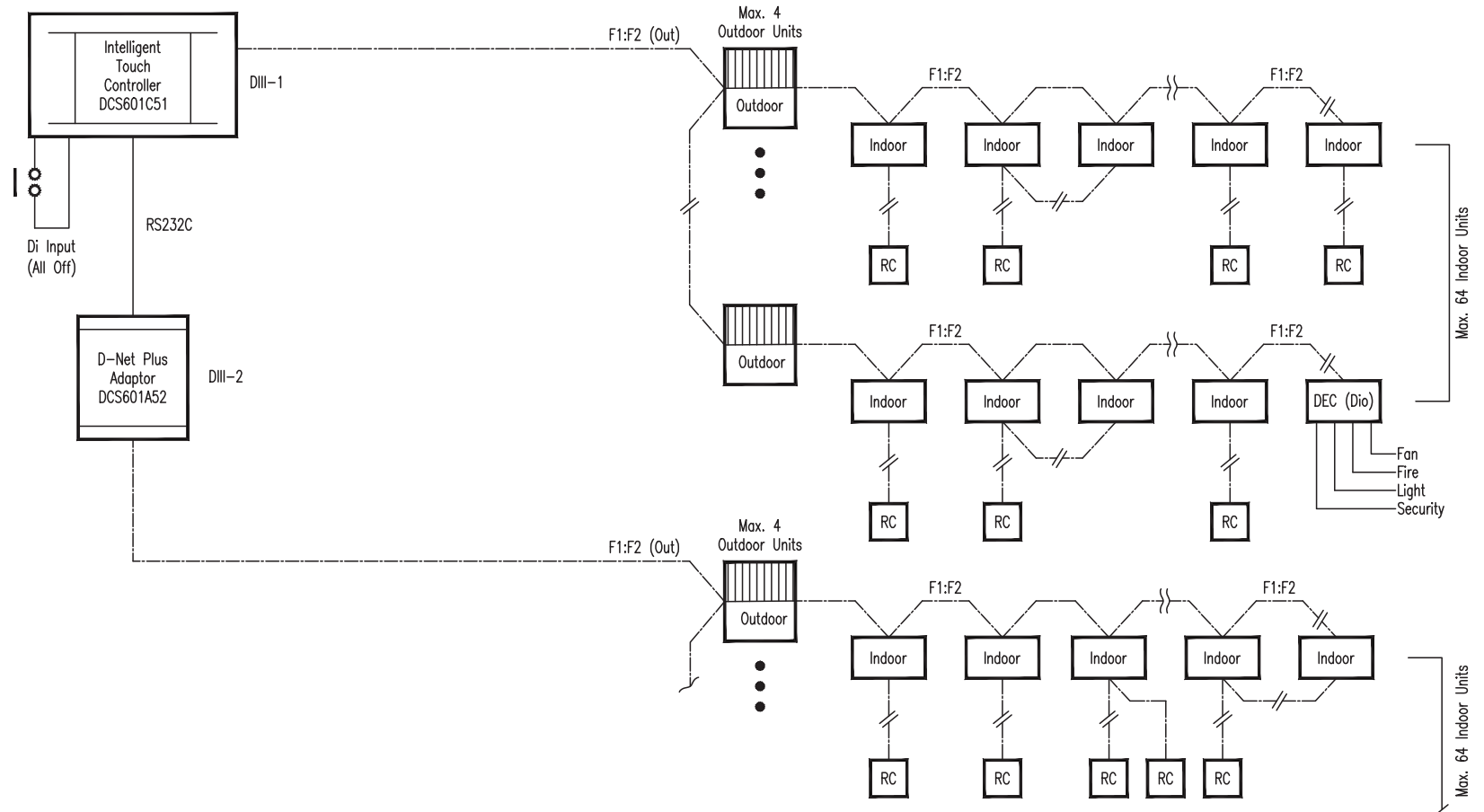
VRF CONTROLS



DCS601C51 - intelligent Touch Controller (iTc)

The DSC601C51 provides the building owner with control, monitoring and scheduling of up to 128 indoor units from a central location.

Specification		
Model Name	intelligent Touch Controller (DCS601C51)	D -NET Plus Adaptor (DCS601A52)
Power Source	Externally supplied 220-240 VAC 50 Hz	Externally supplied 220-240 VAC 50 Hz
Dimensions (WxHxD)	230 x 147 x 107 (mm)	157 x 190 x 42 (mm)
LCD	5.7 inches / QVGA 320 ' 240 / 4096 colours	
Connection terminal (D3)	F1 : F2	F1 : F2
Max No of Indoor / Outdoor Units	64 / 4	64 / 4
Environment (Avoid direct sunlight)	0°C to 40°C < 85% RH	-10°C to 40°C < 90% RH





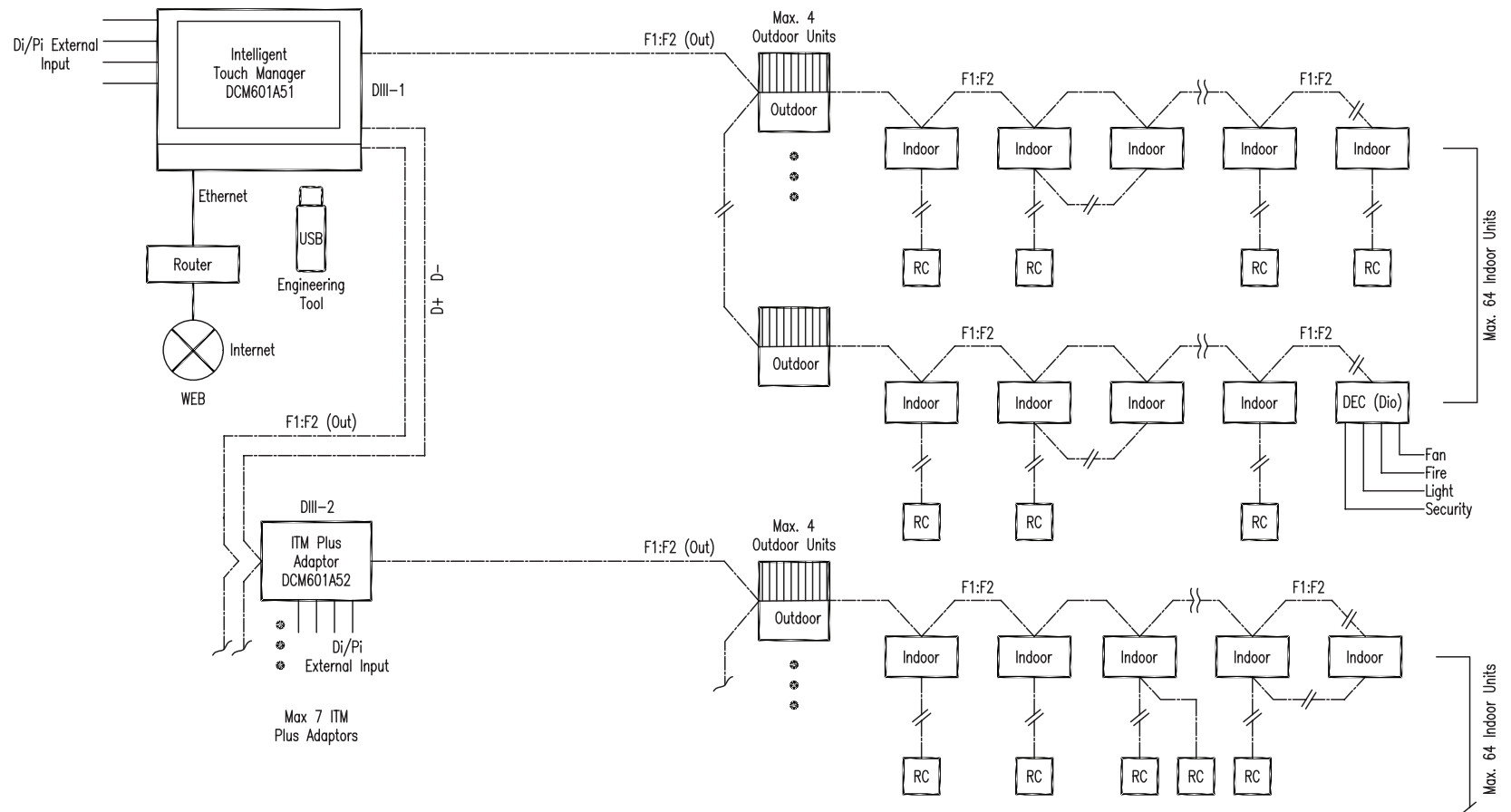
VRF CONTROLS



DCM601A51 - intelligent Touch Manager (iTM)

The DCM601A51 provides the building owner with control, monitoring and scheduling of up to 512 indoor units from a fixed central location or via a Web Browser. Floor plan can be imported to provide easy graphical display.

Specification		
Model Name	intelligent Touch Manager (DCM601A51)	iTM plus adaptor (DCM601A52)
Power Source	Externally supplied 220-240 VAC 50 Hz	Externally supplied 220-240 VAC 50 Hz
Dimensions (WxHxD)	290 x 243 x 50 (mm)	160 x 149 x 62 (mm)
Connection terminal (D3)	F1 : F2 & D+ : D-	F1 : F2 & D+ : D-
No of iTM plus adaptor	7	
Max No of Indoor / Outdoor Units	512 / 32 (8 x 64 / 4)	64 / 4
Environment (Avoid direct sunlight)	0°C to 40°C < 85% RH	-15°C to 60°C < 85% RH





VRF CONTROLS



DMS502B51 - BACnet® Gateway

The BACnet® / IP Gateway permits exchanges of information between the Yanmar proprietary control system and the BMS system.

Specification	
Model Name	BACnet® Gateway (DMS502B51)
Power Source	Externally supplied 220–240 VAC 50 Hz
Dimensions (WxHxD)	263 x 275x 82 (mm)
Connection terminal (D3)	F1 : F2
No of D3 Networks (Option)	2 (2 can be added with DAM411B51)
Max No of Indoor / Outdoor Units	64 / 4
Weight	2.8 (kg)
Environment (Avoid direct sunlight)	-10°C to 50°C < 90% RH
Option DAM411B51	For additional two (2) D3 Networks
Option DAM412B51	For Gas and Electrical Pulse Inputs (8 x Pi)

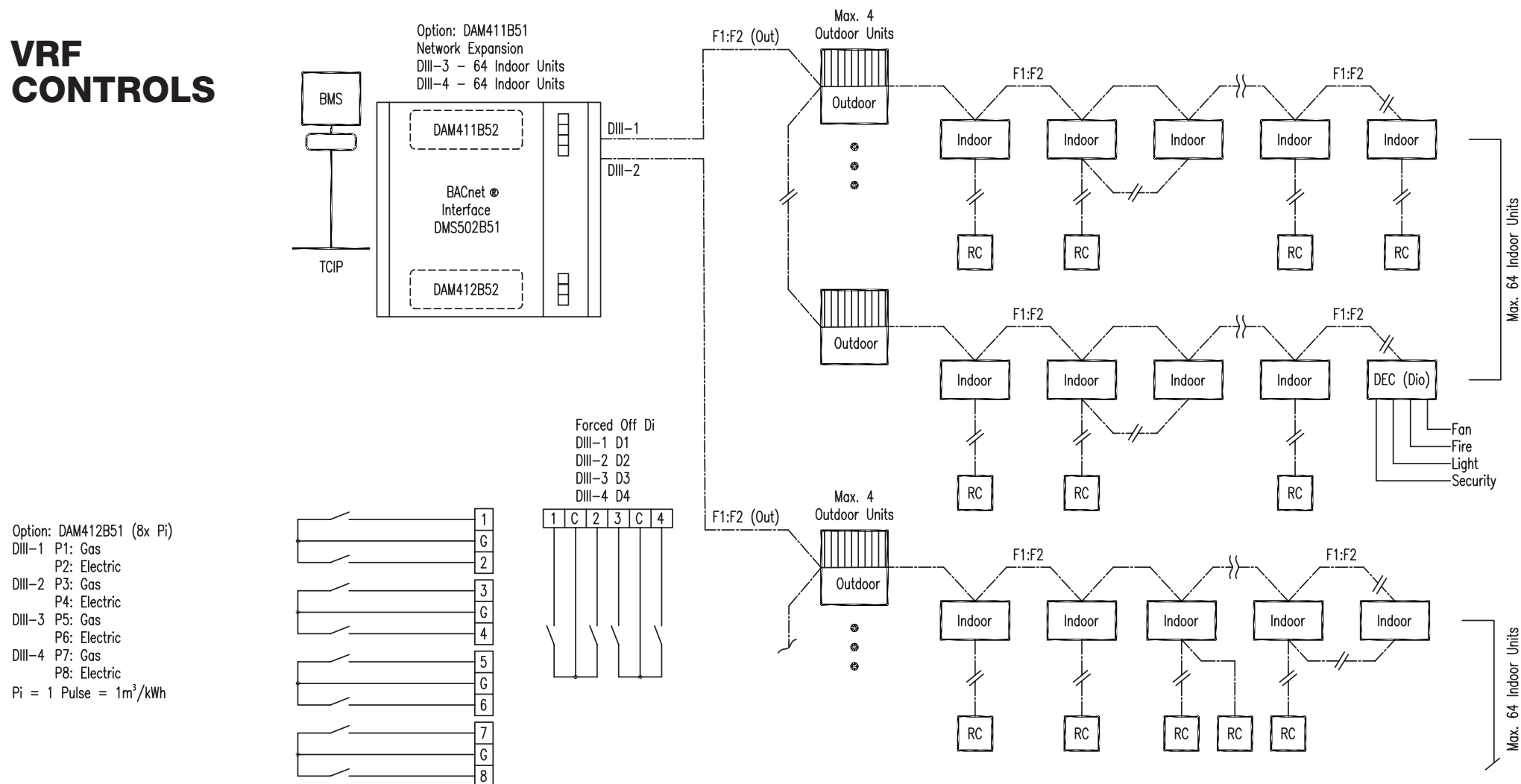
Note DAM412B51 provides energy inputs for EPD (Energy Proportional Distribution Function)

Object List						
Member number	Standard name	Object name (XXX represents the air conditioner number/ address.)	Object type	Unit		
				Inactive	Active	
				Text-1	Text-2	Text-3
1	Start / stop (setting)	StartStopCommand_XXX	BO	Stop	Operation	
2	Start / stop (status)	StartStopStatus_XXX	BI	Stop	Operation	
3	Alarm	Alarm_XXX	BI	Normal	Malfunction	
4	Malfunction code	MalfunctionCode_XXX	MI	Normal	See Yanmar Error Code List	
5	Air-conditioning mode (setting)	AirConModeCommand_XXX	MO	Cooling	Heating	Fan
6	Air-conditioning mode (status)	AirConModeStatus_XXX	MI	Cooling	Heating	Fan
7	Air flow rate level (setting)	AirFlowRateCommand_XXX	MO	Low	High	
8	Air flow rate level (status)	AirFlowRateStatus_XXX	MI	Low	High	
9	Measured room temperature	RoomTemp_XXX	AI	°C		
10	Set room temperature	TempAdjust_XXX	AV	°C		
11	Filter sign signal	FilterSign_XXX	BI	No	Yes	
12	Filter sign signal reset	FilterSignReset_XXX	BV	Reset		
13	Remote controller enable /disable (start / stop)	RemoteControlStart_XXX	BV	Enabled	Disabled	
14	Remote controller enable /disable (mode)	RemoteControlAirConModeSet_XXX	BV	Enabled	Disabled	
15	Blank					
16	Remote controller enable /disable (set temperature)	RemoteControlTempAdjust_XXX	BV	Enabled	Disabled	
(*)17	Central control (lower central control disable)	CL_Rejection_XXX	BV	Enabled	Disabled	
18	Accumulated gas	GasTotalPower_XXX	Accumulator	m3		
19	Accumulated power	ElecTotalPower_XXX	Accumulator	kWh		
20	Communication status	CommunicationStatus_XXX	BI	Normal	Error	
(*)21	Forced system stop	SystemForcedOff_XXX	BV	Clearance	Forced stop	



VRF CONTROLS

DMS502B51 - BACnet® Gateway





VRF CONTROLS



DMS502B51 / LV256B2 - Aircon Manager

Aircon Manager is a PC connection central controller with Energy Proportional Distribution.

Specification	
Model Name	Aircon Manager (DMS502B51/ LV256B2)
Power Source	Externally supplied 220–240 VAC 50 Hz
Dimensions (WxHxD)	263 × 275× 82 (mm)
Connection terminal (D3)	F1 : F2
No of D3 Networks (Option)	2 (2 can be added with DAM411B51)
Max No of Indoor / Outdoor Units	64 / 4
Weight	2.8 (kg)
Environment (Avoid direct sunlight)	-10°C to 50°C < 90% RH
Option DAM411B51	For additional two (2) D3 Networks
Option DAM412B51	For Gas and Electrical Pulse Inputs (8 x Pi)

Note DAM412B51 provides energy inputs for EPD (Energy Proportional Distribution) function.

EPD

EPD (Energy Proportional Distribution) provides proportioning of the gas and electric submeter inputs for energy distribution to indoor unit groups

This system calculates energy consumption by the capacity of indoor units, run time, expansion valve and indoor temperature versus the indoor set temperature.

Each network (64 indoor unit / 4 outdoor units) can have 1 x gas sub meter and 1 x electrical sub meter

A total of 4 networks can be combined with 4 gas sub meter and 4 electric sub meters.

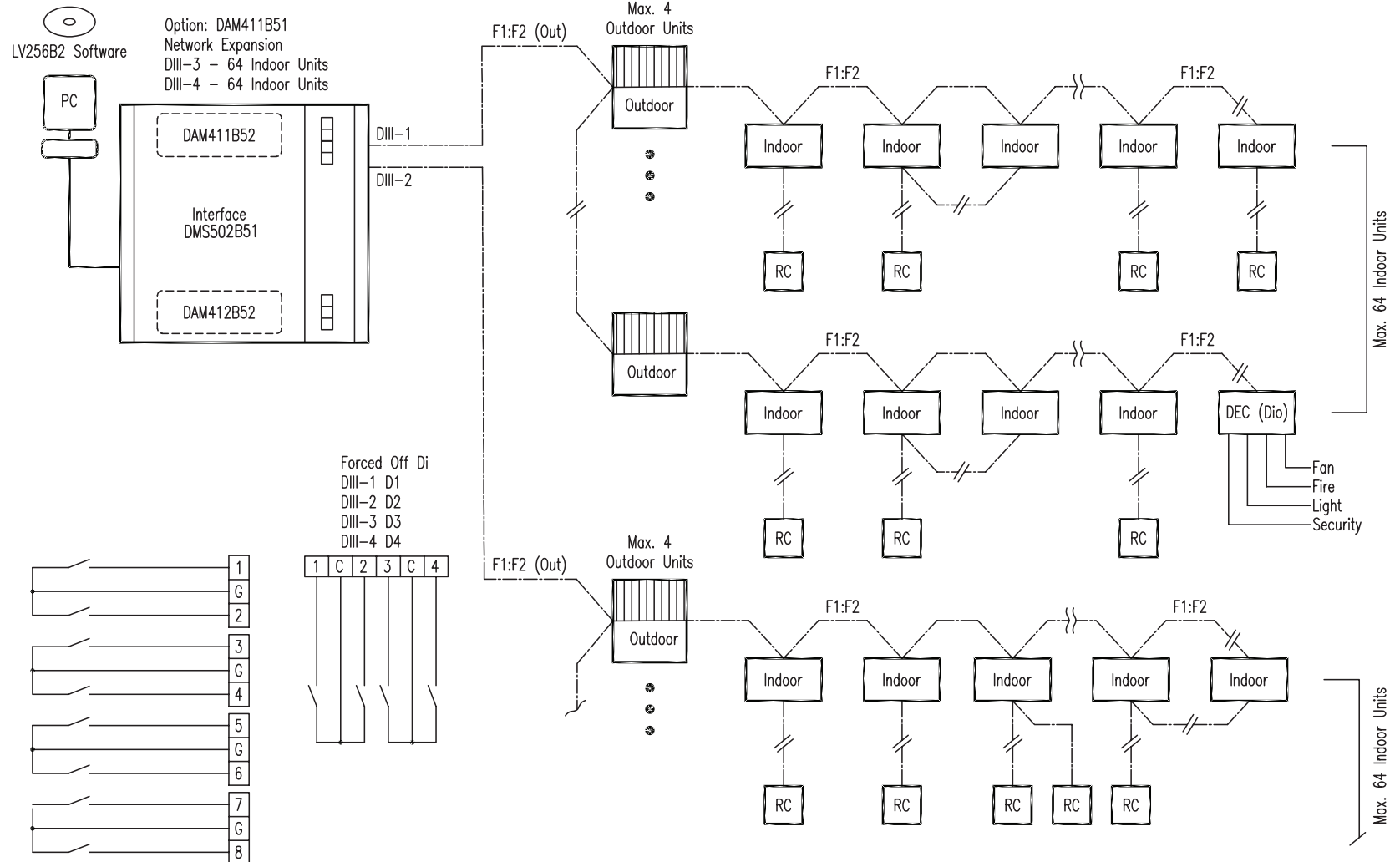
PC Specification

CPU: Intel® Core2 Duo 3.00GHz
 Main RAM: 2GB
 HD: 255GB
 OS: Windows XP Professional or Windows 7 (32 bit)



DMS502B51 / LV256B2 - Aircon Manager

VRF CONTROLS



Option: DAM412B51 (8x Pi)
DIII-1 P1: Gas
P2: Electric
DIII-2 P3: Gas
P4: Electric
DIII-3 P5: Gas
P6: Electric
DIII-4 P7: Gas
P8: Electric
Pi = 1 Pulse = 1m³/kWh



VRF CONTROLS

Interlock Control Options

Di & Dio digital controllers allow connection of ancillary items (Fans, Lights etc) to interlock with schedules and operations in combination with central controllers.

Di unit (DEC101A51)

This dedicated monitoring adaptor keeps track of the operation status and malfunctions of connected equipment



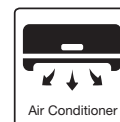
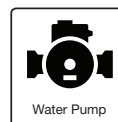
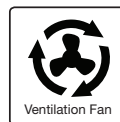
Dio unit (DEC102A51)

In addition to the monitoring functions of the Di unit, this adaptor adds on/off and other operation capabilities



D3-Ai unit (DAM101A51)

This temperature sensor unit measures the outdoor temperature.



Specification			
Item	Di Unit (DEC101A51)	Dio Unit (DEC102A51)	D3-Ai Unit (DAM101A51)
Input	8 Pairs of On/Off input and abnormality input	4 Pairs of On/Off input and abnormality input	1 external temperature sensor and 1 multi-purpose sensor
Output		Normal Output 4 units	
Installation method	Indoor installation		Outdoor Installation
Environment	-10°C to 40°C < 85% RH		-15°C to 50°C < 85% RH
Weight	2.5		1.5
Dimension (WxHxD)	335x198x70 mm		357x211x75 mm
Connection terminal (D3)	F1 : F2		
Max No of units	8	4	1

Dio Output Specification			Di / Dio Input Specification
Voltage Specification	Maximum Current	Minimum Current	Volt Free
AC 220~240V	1.5A	10mA	Micro Current load 12VDC, 1mA or less
AC5-24V	1.5A	10mA	Wiring length 150m Max

YANMAR VRF SPECIFICATION

Introduction

The YANMAR gas powered air conditioning system consumes 1/10th of the electrical input of an equivalent electrically driven air conditioning system. A gas driven engine drives the compressor(s) from 800~2800rpm to distribute refrigerant via a network of refrigeration pipes combining proprietary branch and header kits to indoor units of various types and capacities.

The YANMAR gas powered air conditioning system offers lower running costs, lower emissions and superior heating performance by recovering engine waste heat to avoid regular defrost cycles compared with an electrically driven air conditioning system.

General

- The heat pump system shall be capable of providing either heating or cooling to the connected indoor units.
- The heat pump hot water recovery system shall be capable of providing either heating or cooling & hot water recovery from the engine.
- The heat recovery system shall be capable of providing simultaneous heating and cooling operations to all connected branch selector boxes.
- The YANMAR gas powered air conditioning system has a 12 month/ 2000 hrs parts and labour warranty, 36 month/ 6000 hrs on compressors.
- The YANMAR gas engine requires service at 10,000 Hr intervals or 5 years, whichever occurs first.
- The YANMAR gas powered air conditioning system has a life expectancy of 15~20yrs depending on use and environment.
- The system shall be manufactured by YANMAR and can operate on Natural Gas, LPG or Butane Gas.
- Commissioning assistance is provided by Yanmar Energy Australia's technical department.

Outdoor Unit

There shall be a range of condensing units to suit various applications.

- The outdoor condensing unit shall be a self-contained, air-cooled, factory assembled, packaged unit.
- The outdoor condensing unit shall be heat pump, heat pump hot water or heat recovery type.

- Cooling operation shall be provided during outdoor temperatures of 0°C to +46°C (-10°C with air guard).
- Heating operation shall be provided during outdoor temperatures of -10°C to +26°C.
- The outdoor condensing units shall be available in a range of capacities from 14kW to 85kW.
- The outdoor condensing units shall have a connectable indoor unit capacity from 50% to 130%.
- The outdoor unit shall provide capacity control down to 2.2kW of indoor demand.
- All outdoor units shall be suitable for a power supply of 220-240V / 1 phase / 50Hz or 200V / 1 Phase / 50Hz, where 200V models are supplied, a step down transformer is supplied by Yanmar Energy Australia.
- All outdoor units require 1.0 ~ 2.5kPa of natural gas pressure (2.0 ~ 3.3kPa for LPG, 0.7 ~ 2.2kPa for butane gas).
- The outdoor unit shall have a start current and run current as detailed in the electrical characteristics for the equipment.
- The outdoor unit shall be complete with expansion valves, oil separator, crankcase heaters, suction/ discharge and liquid shut off valves, strainers, liquid receivers and accumulators, compressors and fan motors.
- The outdoor unit shall be complete with all safety devices including high pressure switches, transducers, fuses and thermal protectors for compressors, heat exchanger, engine and fan motors.
- The outdoor unit shall be weatherproof, factory assembled, pre wired and complete with all necessary engine and refrigerant controls.
- The outdoor unit fan motor(s) shall be totally enclosed and incorporate a thermal fuse. The outdoor unit fan motor(s) shall have multi speed operation to maintain constant head pressure control in all modes of operation within the ambient parameters.
- Access to the outdoor unit(s) for routine service and maintenance shall be through all removable panels.
- The 14 and 18kW outdoor units shall be provided with a horizontal condenser air discharge.
- The 22~85kW outdoor units shall be provided with a vertical condenser air discharge with an optional setting of 30Pa ESP available.
- Where a discharge air duct is used, removable ducting is recommended to ensure access to the fan section. A flexible connection is required to reduce vibration transmission.

YANMAR VRF SPECIFICATION

- The outdoor unit heat exchanger shall be formed of seamless copper tube, with internal grooving and mechanically bonded to aluminium fins.
- The unit casing shall be manufactured from polyester powder coated galvanised sheet steel. The colour finish shall be warm ivory (5Y7.5/1)
- Avoid use in corrosive environments, if applied in corrosive environments ensure Blygold or equal corrosion protection is applied at time of quotation/ order. Ongoing maintenance shall be carried out by a specialist (Blygold or equivalent).
- Outdoor unit location shall be selected to ensure no recycling of discharge air. Ensure exhaust emissions will not accumulate or be drawn into any air intake. Exhaust emissions can cause poisoning in high concentration.
- The external sound pressure levels shall not exceed 62 dB (A).
- When the condenser is located on a roof or platform, install a proprietary vibration isolator balanced specifically for the unit.
- When it is necessary to extend the exhaust, use an exhaust adaptor for connection from the condenser to the external exhaust system. An additional drain filter kit (DFB19E) will also be necessary to neutralise the additional condensate.
- The external exhaust can be extended a maximum of 10m with bend restrictions.

Indoor Units

There shall be a range of indoor units to suit the various applications

- YZCP Series – Round Flow Cassette
- YZDP Series – High Static Ducted
- YZSDP Series – Low Profile Ducted
- YZAP Series – Wall Mounted
- YZHP Series – Under Ceiling
- Each indoor unit shall have the ability to operate independently of other indoor units connected on the same refrigerant system.
- Each indoor unit shall have the ability to have a different set temperature, airflow rate, on/off status and mode (Note: The mode must be the same for all indoor units if using a heat pump type system).
- The indoor unit shall include a fan impeller with direct drive fan motor. The motor shall be sealed and lubricated for life. The whole assembly shall be statically and dynamically balanced.

- The supply air fans shall be of a large diameter and design to ensure efficient operation and low sound levels.
- The indoor unit (except YZDP type) shall incorporate a return air filter. Filters shall be removable via the front, or underside of the unit without removing any screwed panels. Filters shall be of the washable type unless otherwise specified.
- The indoor unit shall be constructed from galvanised sheet metal panels or moulded plastic.
- The indoor unit heat exchanger shall be manufactured from seamless copper tubes with internal grooving, and mechanically bonded to aluminium fins. All tubes shall be brazed into copper headers and fully tested at works. The refrigerant pipe terminations shall be fitted with brazed/ flange or flared connections complete with flare nuts.
- The indoor unit shall incorporate a one-piece insulated drain tray. The drain connection shall be of a suitable size and be connected to a gravity condensate system. Condensate pumps are supplied as an inclusive part of the indoor unit depending on the indoor unit type or as an optional accessory.
- All indoor units shall have the necessary space for service when selecting a suitable location and free from recycling of discharge air.
- All indoor units shall be suitable for a power supply of 240V / 1 phase / 50Hz.

BS Unit

There shall be a range of branch selector (BS) unit to suit the various connection requirements. The function of a BS unit is to permit cooling or heating operations to the indoor units connected downstream. A BS unit is used to define a cool / heat zone, where multiple BS units are applied to a common zone, group BS units collectively in a zone with a central controller.

- Brazed connection shall be used for connection to the BS Unit.
- Three (3) pipes shall enter & Two (2) pipes shall exit the BS Unit.
- All BS Units shall have the necessary space for service when selecting a location.
- The flow of refrigerant through a BS Unit can create noise. Do not install in a noise sensitive areas.
- Up to eight (8) indoor unit can be installed to the secondary side of the BS unit (5 for YBSVP112PV1).

YANMAR VRF SPECIFICATION

Refrigerant System

- The refrigeration works shall utilise the flexible range of branch pipe kits and header kits supplied by YANMAR.
- The fittings and system shall be installed in accordance with the manufacturer's recommended procedures, allowing unrestricted flow of refrigerant.
- The use of reducing tees and "P" traps shall not be permitted. Equal pressure drop at a branch/ header connection is essential.
- The maximum level difference of the outdoor unit and indoor units shall be 50m, when the outdoor unit is above the indoor unit, or 50m when the outdoor unit is below the indoor unit. (30m for 140/180 models).
- The maximum standard one way length of refrigerant piping shall be 170m, 200m equivalent length taking into account bends (60m total/ 72 equivalent length for 140/180 models).
- The maximum piping length after the first branch shall be 90m. (20m for 14kW / 18kW models).
- A maximum of 15m height difference between all indoor units.
- The maximum total piping length shall be 640m (100m for 14kW / 18kW models).
- Interconnecting pipe work shall be connected to the outdoor unit terminations using brazed/ flare / flange connections in accordance with the manufacturer's installation requirements.
- Refrigerant piping shall be insulated with heat resistant polyethylene foam with a thermal heat resistance of 120°C. Apply insulation thickness in accordance with section J requirements for the system capacity.
- Ensure piping insulation is installed to make a vapour seal throughout the entire piping network to avoid water leakage from condensation.
- Pipe supports shall not be placed within 1.5mtr of the outdoor unit to avoid vibration transmission.
- All brazed joints shall be made with dry nitrogen purge to ensure the prevention of oxidation to the internal surface of the copper pipes. The ingress of moisture, dirt and any other contamination to the system shall be prevented during the installation procedure.
- Pressure testing using dry nitrogen shall be done to 4.1MPa external of the condenser service valves for a 24 hour confirmation period and connected to the service valves at 2.0MPa for verification of condenser connections prior to evacuation.

- The system shall be triple evacuated/ dehydrated to below 200 microns to be witnessed at time of commissioning by Yanmar Energy Australia technical staff.
- The outdoor unit shall be factory charged, additional refrigerant shall be added to achieve the condenser base charge and additional refrigerant in accordance with the liquid line piping lengths for each segment. Field piping lengths shall be accurately documented by the contractor to determine the critical charge of the system.
- The concentration limit for R410A is 0.44kg/ m3. Whilst R410A refrigerant is a safe non-toxic gas it can in high enough concentrations pose a suffocation risk as can any refrigerant. While the risk is relatively low, for any occupied room through which the pipe work travels or within which a unit is installed, the concentration level that would be achieved in event of leakage should be calculated as follows

Total system refrigerant charge (kg)

_____ ≤ Concentration limit (kg/m3)

Minimum volume of the room (m3)

If the resultant concentration limit is greater than 0.44kg/ m3, mechanical ventilation and or fixed leak detectors should be installed.

Gas Train

A gas train is required for Type B appliance to be connected to gas connection.

- The gas train shall be constructed in accordance with AS/NZS 5601 for Type B inspection and approval.
- Gas piping shall be sized to maintain the required pressure to the outdoor unit.
- The gas train is supplied as a complete unit, factory tested for easy connection and enclosed in a weather proof case.
- The gas supply shall be purged by the contractor to the gas train, prior to commissioning.
- The gas train shall be interlocked to the Yanmar system to operate in combination with the engine start sequence.

YANMAR VRF SPECIFICATION

Wiring

- Control wiring shall consist of a two-core, non-polar, screened cable 0.75~1.25mm², specification: RS/823/128.
- Remote control wiring shall consist of a two-core, non-polar, screened cable 0.75~1.25mm², specification: RS/823/128.
- The control wiring shall be installed separate to the mains power wiring and linked to each successive unit as detailed on the system schematic drawing.
- All indoor units on the same refrigerant system shall have a common single phase power source that can be isolated by a circuit breaker, where a separate power source is taken from various tenancies, use a multi-tenant adaptor DTA114A61.

System Control

- An electronic expansion valve (EEV) and capillary tube shall regulate the flow rate of refrigerant to indoor units. The EEV pulse shall keep the unit operating at the optimum condition in accordance with the room temperature and set temperature. The EEV shall be controlled by the microprocessor control board within the indoor unit.
- The indoor unit shall be provided with its own integral temperature sensor fixed onto or adjacent to the return air grille/ intake measuring the return air temperature. If outside air is introduced to the return air path, a remote sensor (YEA-RS) shall be installed or select the remote controller sensor.
- The temperature control system shall minimise the start/stop operation of the refrigeration system by checking for any thermal unevenness. The overall effect shall be that the indoor unit on-off operations are suppressed to the minimum level possible. The system shall condition the air and maintain the room temperature.
- The outdoor unit controller shall accumulate the total indoor unit demand and set the response capacity of the mechanical plant to maximise efficiency automatically.
- Each indoor unit or group of indoor units shall be served by a wall remote controller (LC1E62) for operational setting of the room.
- Central Control Systems can be combined to manage indoor units from a central point, web browser or application using proprietary control options or interfacing to a third party BMS system.

Maintenance

- General maintenance of the equipment shall be carried out periodically to ensure filters, heat exchangers and condensate systems are clean. Observation of noise, vibration, corrosion should be noted and operational data reviewed to be within specification.
- Engine Maintenance intervals shall be 10,000 hours or 5 years; whichever occurs first. This incorporates changing oil, oil filter, belt, air filter and spark plugs provided by Yanmar.
- Engine maintenance typically costs around \$0.17 per engine hour for the first 19,900 hrs, \$0.27 per engine hour from 19,900~39,900.
- Engine Maintenance frequency shall depend on operational use, a typical application operates for 10 hours per day, 5 days per week, approx. 2500 hr Pa, for normal use the frequency will be 4 years.



YANMAR ENERGY AUSTRALIA

YANMAR ENERGY AUSTRALIA PTY LTD
1800 052 464
www.yanmarenergy.com.au

