YANMAR

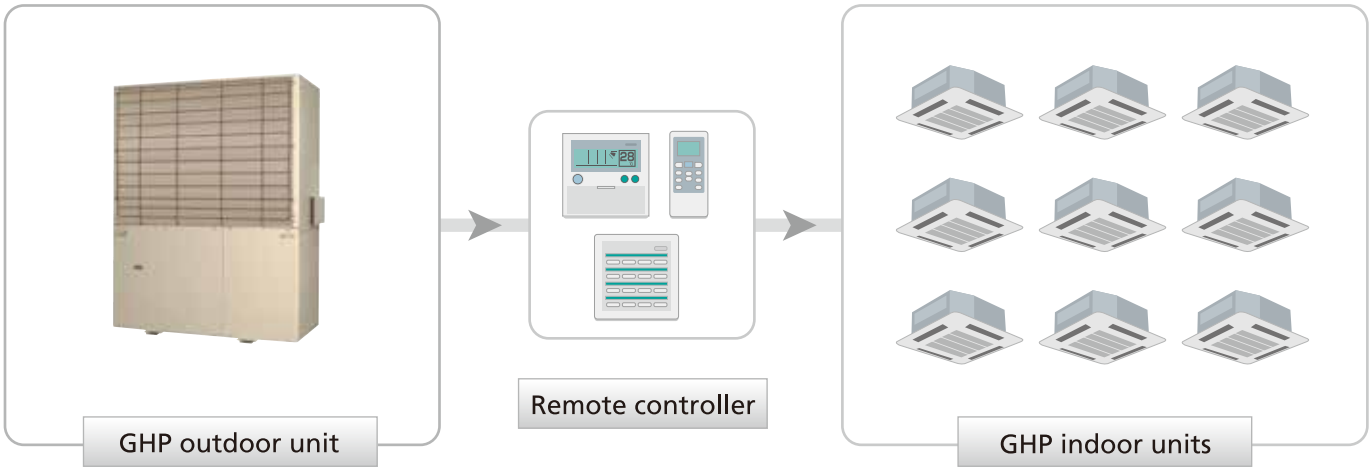
GHP Catalogue

Gas Engine Heat Pump
VRF Air Conditioning System

Overview of GHP (Gas-engine Heat Pump) Air-conditioning System

The Yanmar GHP variable refrigerant flow (VRF) air-conditioning system provides a very flexible way to provide highly efficient gas powered heating and cooling for buildings. Each system comprises of a gas engine powered outdoor unit which exchanges heat energy with the outdoor air, and multiple indoor units which exchange heat energy with the air in the building. The system as a whole effectively pumps heat energy between the outdoor air and the air inside the building. This gives very high efficiency since the outdoor air is a renewable source of energy and many units of heat energy get moved for every unit of energy needed to operate the system. With a wide range of equipment and control options available these systems can provide high efficiency and low environmental impact air-conditioning solutions for a multitude of different applications.

Overview of GHP (Gas-engine Heat Pump) Air-conditioning System Structure



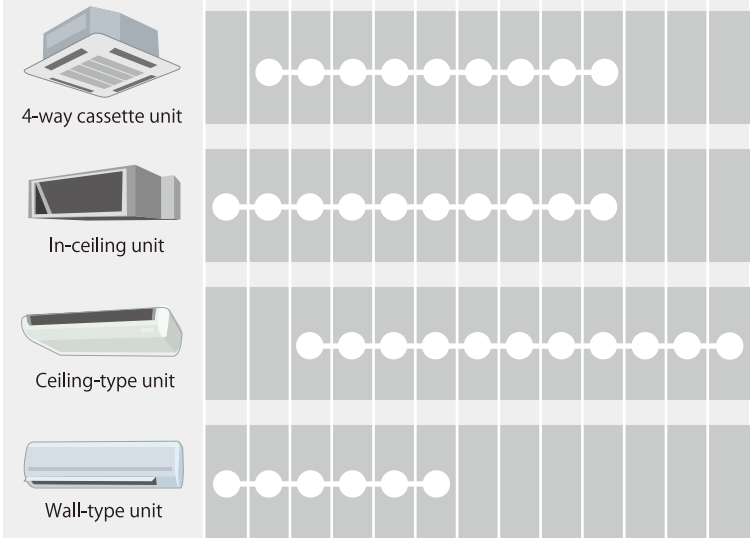
GHP outdoor unit lineup

Rated output Heating & Cooling	Indoor units connection capacity
50.0kW 45.0kW	Max number 26 Max Capacity 58.5kW Min Capacity 22.5kW
63.0kW 56.0kW	Max number 32 Max Capacity 72.8kW Min Capacity 28.0kW
80.0kW 71.0kW	Max number 40 Max Capacity 92.3kW Min Capacity 35.5kW
95.0kW 85.0kW	Max number 48 Max Capacity 110.5kW Min Capacity 42.5kW

GHP indoor unit lineup

Capacity KW

Cooling	2.2	2.8	3.6	4.5	5.6	7.1	8.0	9.0	11.2	14.0	16.0	22.4	28.0
Heating	2.5	3.2	4.0	5.0	6.3	8.0	9.0	10.0	12.5	16.0	18.0	25.0	31.0



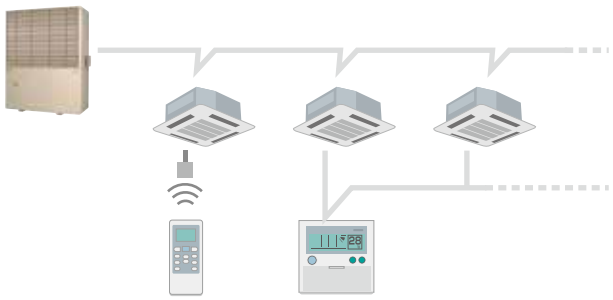
GHP VRF AIR CONDITIONING SYSTEM

Centrally controlled system – centralized controllers

In addition to the wide range of outdoor and indoor units in the product lineup another key factor that adds to the flexibility of the Yanmar GHP VRF air-conditioning system is the wide range of control options that are available. Depending on the size, and how the system will be operated, different levels of control solutions can be provided to ensure the system meets the various needs of the building's occupants and system operation can be managed effectively. In overall terms there are three basic methods of control as described below.

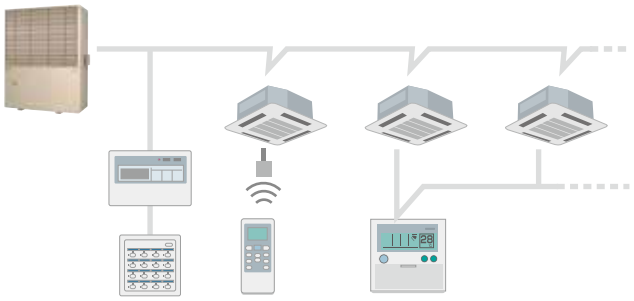
Locally controlled system – indoor unit remote controllers

For applications where only local control of the air-conditioning system is required remote controllers that control one or more indoor units directly offer an effective control solution. It is also possible to lock some of the settable parameters to maintain some degree of system management.

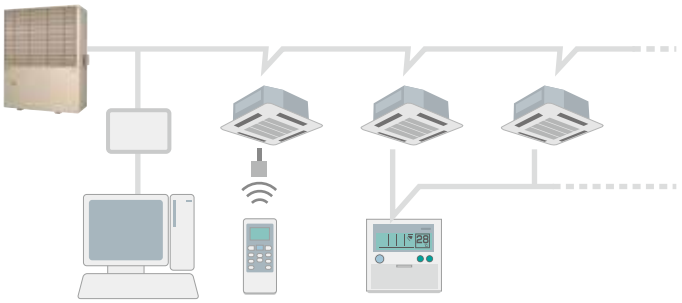


Centrally controlled system – centralized controllers

For applications where there is a need to manage certain aspects of the air-conditioning system operation, in addition to local control of basic setting parameters, there are a number of centralized control options available. These allow groups of units to be controlled, operation scheduling as well as providing billing information for multi-tenant buildings.



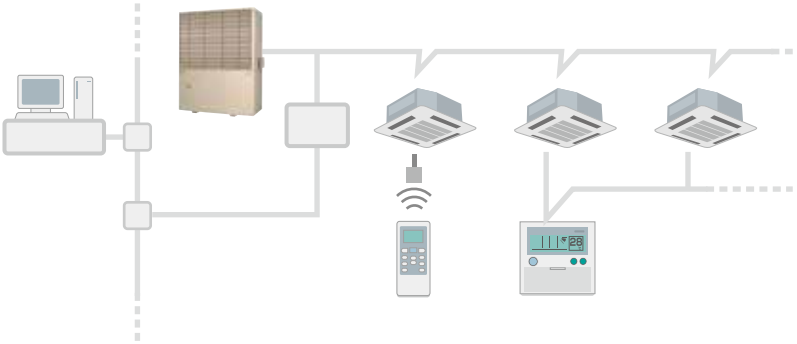
Unit based centralized control- up to 160 indoor units
Multiple controllers can be connected for expansion.



PC based centralized control- up to 160 indoor units
Multiple interfaces can be connected for expansion.

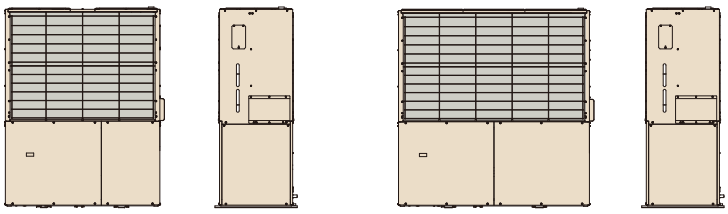
Integrated system – connection to building control systems via network communications

For applications where multiple building systems are controlled by a centralized system via a communications network the air-conditioning system can be integrated into the wider building system control network using a network interface device. This approach allows great flexibility, control of the entire system and easy expansion via multiple interfaces.



OUTDOOR UNIT LINE-UP

ANCP series GHP outdoor units are available in 45kW, 56kW, 71kW and 85kW models. This series is designed for regions covered by C-tick regulations.



Outdoor unit line-up

Model	OD = outdoor ID = indoor		Standard GHP			
			ANCP450J	ANCP560J	ANCP710J	ANCP850J
OD unit capacity (*1)	Cooling / heating	kW	45.0 / 50.0	56.0 / 63.0	71.0 / 80.0	85.0 / 95.0
	Low / cold temperature heating	kW	53.0 / 53.0	67.0 / 67.0	74.5 / 74.5	82.0 / 82.0
ID unit connection capability data	ID unit total capacity min / max	kW	22.5 / 58.5	28.0 / 72.8	35.5 / 92.3	42.5 / 110.5
	Max number of ID units	-	26	32	40	48
Electrical data	Supply voltage (frequency)	V(Hz)	240V (50Hz) single phase			
	Current for cooling / heating	A	3.98 / 3.53	4.53 / 4.21	6.71 / 6.30	7.60 / 6.91
	Power for cooling / heating	kW	0.87 / 0.77	0.99 / 0.92	1.45 / 1.36	1.66 / 1.51
Gas consumption HHV data (*2)	Natural gas for cooling/ heating	kW	34.3 / 32.5	45.4 / 43.1	56.7 / 56.2	67.7 / 66.3
	LPG for cooling/ heating	kW	33.6 / 31.8	43.3 / 41.0	55.3 / 54.9	66.0 / 64.8
Weight	OD unit weight at shipment	kg	870	890	1,080	1,080
Gas engine	Engine type	-	Yanmar Gas Engine			
	Specified engine lubricant	-	Yanmar genuine GHP oil			
	Specified engine coolant	-	Yanmar genuine GHP coolant			
Sound pressure (*3)	Sound normal / quiet mode	dB(A)	57 / 54	58 / 55	61 / 58	62 / 59
Refrigerant data	Charge quantity	kg	11.8kg of R410A refrigerant			
Pipe size data	Refrigerant piping gas / liquid	mm	28.6 / 12.7	28.6 / 15.9	31.8 / 19.1	31.8 / 19.1
	Fuel gas pipe	-	R 3/4			
	Exhaust vent (exhaust drain)	mm	60.5 outer diameter (15 inner diameter)			
Refrigerant piping	Equivalent / real / total length max	m	200 / 170 / 640			
Height differences	ID unit above / below OD unit max	m	50 / 50			
OD unit colour	Panel colour (Munsell number)	-	Yanmar warm ivory (5Y7.5/1)			

NOTES:

*1) OD unit capacity measurement conditions
OD unit performance at given temperatures with standard OD and ID unit combination, 7.5m piping length and 0m height difference.

	ID unit air inlet		OD unit air inlet	
	DBT	WBT	DBT	WBT
Cooling / heating	19°C / 20°C	27°C / -	35°C / 7°C	- / 6°C
Low / cold temperature heating	20°C / 20°C		2°C / -7°C	1°C / -8°C

NOTES:

*2) Gas consumption (m^3N/h) = Fuel consumption (kW) / HHV
*3) Natural gas pressure specification:
Target pressure 2.0 kPa (max 2.5 / min 1.0 kPa)
LP gas (propane) pressure specification:
Target pressure 2.8 kPa (max 3.3 / min 2.0 kPa)

Specifications are subject to change without notice due to product improvements.

OUTDOOR UNIT LINE-UP

Outdoor unit options

In order to allow the ANCP series to be installed in a wide range of locations the following options are available. For further details please refer to technical literature or consult your local dealer.

Anti-vibration mount

Although the ANCP series offers low noise and low vibration operation, there maybe cases such as in rooftop installations where it is necessary to use an anti-vibration mount when installing the unit. This mount is available in two sizes and also for cold weather specification units.

For ANCP450J & ANCP560J models	For ANCP710J & ANCP850J models
YGAS560J	YGAS850J
	

Anti-salt treatment

Anti-salt treatment specification is for outdoor units that are installed near to the sea. To avoid salt-air damage to the outdoor unit key parts are treated with protective coatings. For units exposed to direct sea breezes a further level of protection is required (salt-air heavy damage proof specification).

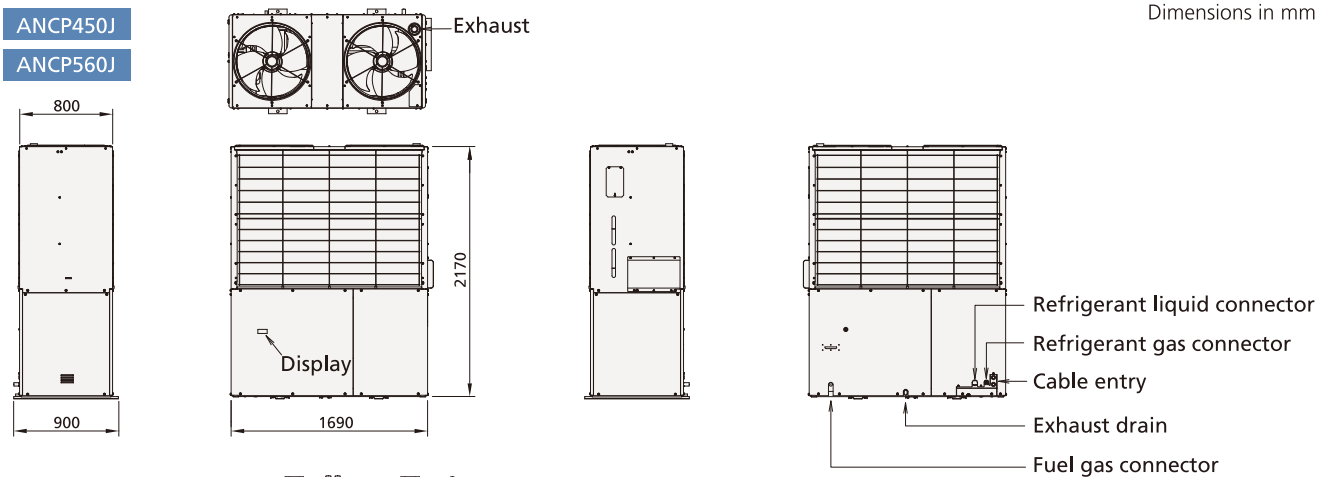
Other options

Wind direction adjuster, air-guard, exhaust extension adapter, exhaust extension adapter drain filter, drain water kit

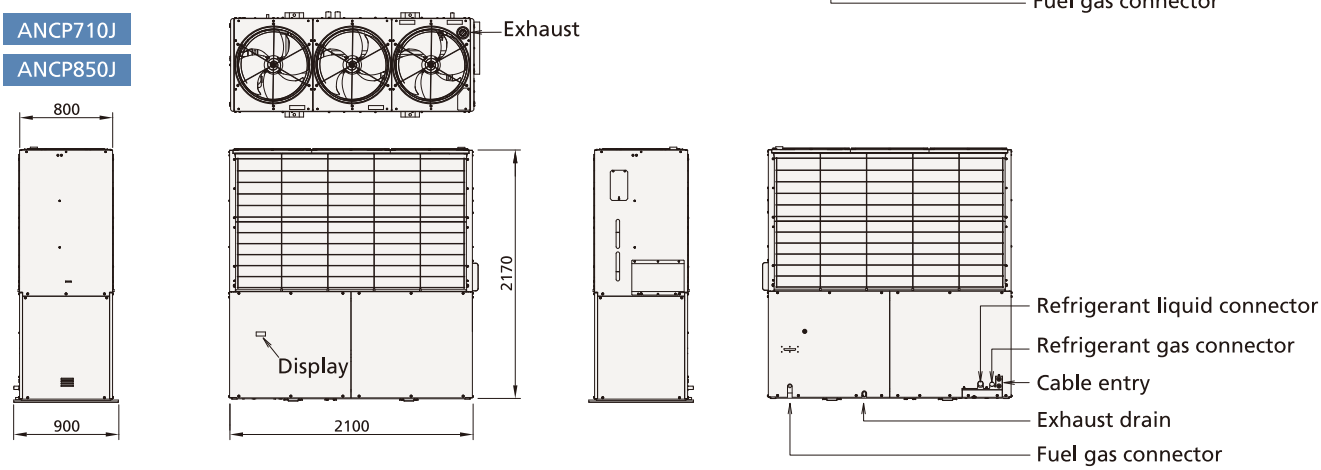
Outdoor unit dimensions

Dimensions in mm

ANCP450J
ANCP560J

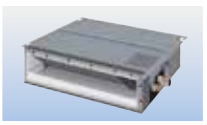


ANCP710J
ANCP850J



D-TYPE INDOOR UNIT LINEUP

In order to create comfort and bring the benefits of gas powered air-conditioning to the widest range of living spaces the indoor unit lineup of the Yanmar GHP air-conditioning system includes a variety of indoor unit styles each with a wide range of power outputs. Each model is designed to provide the optimum performance for each intended application as well as being designed for easy installation and maintenance.

	Output class	P22	P28	P36	P45	P56	P71	P80	P90	P112	P140	P160	P224	P280	P450	P560	P800	P1120	P1160
Capacity KW	Cooling	2.2	2.8	3.6	4.5	5.6	7.1	8.0	9.0	11.2	14.0	16.0	22.4	28.0	45.0	56.0	80.0	112.0	160.0
	Heating	2.5	3.2	4.0	5.0	6.3	8.0	9.0	10.0	12.5	16.0	18.0	25.0	31.5	50.5	63.0	90.0	125.0	180.0
4-way type cassette (with decoration panel)		P28 to P160 class models																	
Double flow cassette (with decoration panel)		P22 to P160 class models																	
Single flow cassette (with decoration panel)		P22 to P36 class models																	
Ceiling mounted duct type (P224 & P228 order made)		P45 to P71, P90 to P140 and P224 to P280 class models																	
Slim ceiling mounted duct type (P224 & P228 order made)		P22 to P71 class models																	
Ceiling suspended type		P36 to P160 class models																	
Wall mounted type		P28 to P71 class models																	
Floor standing duct type (order made)		P140 and P224 to P1600 class models																	
Restaurant –use ceiling suspended type (order made)		P80, P140 class models																	

D-TYPE INDOOR UNIT LINEUP

4-way cassette type

4-way type cassette units are ideal for larger spaces where uniform temperature with gentle air flow and low sound is desired.

Features:

- Extremely low sound
- Air flow over wide area

Typical applications

- Offices
- Meeting rooms
- Shopping centers
- Shops
- Restaurants
- Cafes

Wall mounted type

Wall mounted units offer a very compact and cost effective way to provide air-conditioning in smaller spaces. Easy installation makes these units very suitable for upgrades in existing buildings and maintenance is very simple.

Features:

- Compact size
- Low weight
- Low sound

Typical applications

- Cafes
- Shops
- Small guest rooms

Ceiling mounted type

Concealed type units provide very low visual impact for applications where aesthetic effect is important. These units also offer great flexibility for ducted systems and with a range of air flow outputs to give the optimum balance of air and operating sound level for the length of ducting and the application.

Features:

- Compact body
- Range of air flows
- Compatible with duct accessories

Typical applications

- Restaurants
- Hotel rooms
- Longer ducted systems

Installation examples

Shopping mall

School

Restaurant

Restaurant

Toy store

YANMAR

Yanmar has been a leader in the field of engine based technology since the company was founded in 1912, and over the years Yanmar has earned recognition as a world class innovator and global manufacturing company. The company was founded on a vision of technological innovation to save energy and to help people live better lives, and with the world facing key issues such as energy supply, global warming and food supply, this vision has become more relevant than ever. This is reflected in the many fields such as agricultural machinery, marine engines and craft, construction machinery and energy systems where Yanmar system products contribute to human society around the globe. These products are backed up by the global Yanmar sales and aftersales support network which is dedicated to ensuring that Yanmar users get the maximum benefit from their Yanmar system and that they are glad they chose Yanmar.

YANMAR ENERGY SYSTEM CO.,LTD.

Yanmar had long been involved in the development of cogeneration systems and with the launch of Gas Heat Pumps in 1987, and then gas engine micro-generation systems in 1998, the energy systems business expanded. Also, as the issues of stable energy supply and the environment became more and more important, it was decided in 2003 to form Yanmar Energy Systems Co., Ltd as a separate company dedicated to the development, sales and aftersales service of energy systems that use resources more responsibly and provide greater energy security. The current range of products offered by Yanmar Energy System Co., Ltd. includes Gas Heat Pumps, mid-range and micro-cogeneration systems that operate using natural gas, LPG as well as bio-gas models. In order to bring the benefits of these systems to users around the globe the company has established energy systems groups in major Yanmar global business centers and is currently actively seeking new partnerships with energy suppliers and energy system specialists around the world.

YANMAR ENERGY SYSTEM CO.,LTD. http://yanmar.com

Umeda Gate Tower, 1-9, Tsuruno-cho, Kita-Ku, Osaka, Japan 530-0014
Tel +81(0)6-7636-2213 Fax +81(0)6-7636-1072

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