



**YANMAR**

# CP Series

Gas Engine  
Micro Cogeneration System



**YANMAR ENERGY SYSTEM CO.,LTD.**

# CP MICRO GENERATION SYSTEM LINE-UP

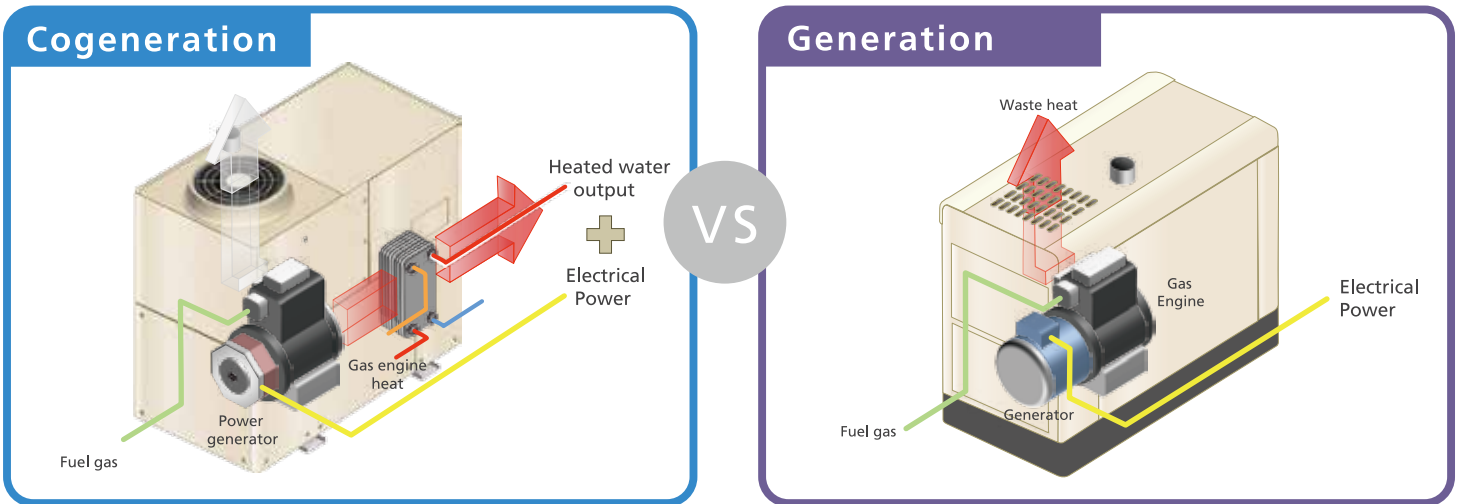
Yanmar CP micro-cogeneration units provide an excellent solution for the efficient generation of electrical power and hot water for a wide range of applications. By utilizing highly efficient and robust Yanmar gas engines these units can reduce energy consumption giving lower energy costs and reduced CO2 emissions as well as operating for extended periods without the need for intervention. The wide range of specifications available, including black out start and biogas powered units, means that Yanmar CP units can be used in wide range of applications and with multi-unit control capability they can be used to make larger cogeneration systems.



- Typical applications include:
- ▶ hospitals
  - ▶ hotels
  - ▶ apartment buildings
  - ▶ retail outlets
  - ▶ restaurants
  - ▶ houses
  - ▶ leisure centers
  - ▶ Industrial facilities

## Comparison of cogeneration and generation

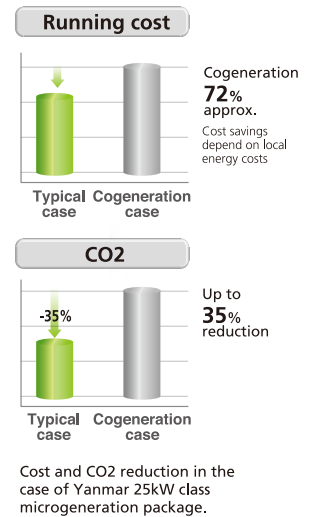
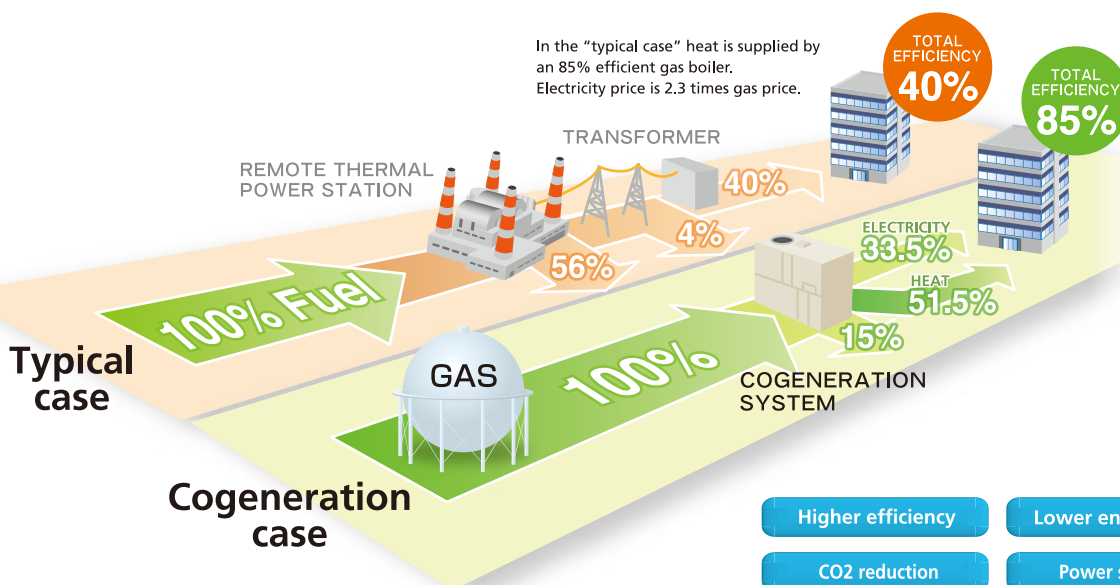
GHP and EHP systems can both provide cooling and heating but there is a key difference in the way the compressor is driven. In a GHP system heat from the gas engine is used to give high efficiency and high performance.



By capturing the waste heat from the gas engine the energy efficiency in the case of cogeneration is much higher than that of generation.

## Comparison of cogeneration and typical remote power generation

Cogeneration offers many advantages as compared to typical remote power generation.



- Higher efficiency
- Lower energy cost
- Biogas capable
- CO2 reduction
- Power security
- High flexibility



# TYPICAL INSTALLATION EXAMPLES OF CP SYSTEMS

**Hospitals**



**Hotels**



**Businesses**



**Houses**



- Typical benefits given by CP systems depending on local conditions and regulations:
- ▶ Power and hot water
  - ▶ Higher efficiency
  - ▶ Energy saving
  - ▶ Reduced energy bills
  - ▶ Reduced CO2 emissions
  - ▶ Green credentials
  - ▶ Power security
  - ▶ Multi-unit system control
  - ▶ Power export and sales

**Biogas**



- ▶ Power and hot water
- ▶ Carbon neutral energy
- ▶ Power export and sales
- ▶ High efficiency even with unstable gas supply

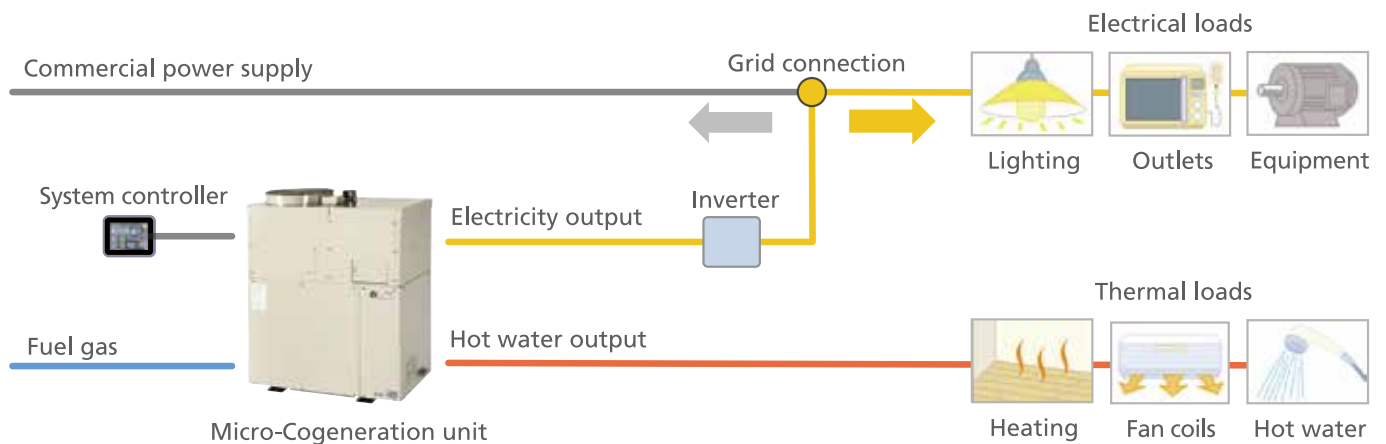





## CP MICRO COGENERATION SYSTEM

The Yanmar CP micro-cogeneration system provides a flexible way to provide high efficiency electricity and hot water for buildings and other applications. The Yanmar CP system utilizes highly robust and efficient Yanmar gas engine technology to generate electrical power and, by reclaiming heat from the engine, the unit also provides a source of hot water. By using this reclaimed heat the total energy efficiency of electricity generation is dramatically improved, often giving a significant reduction in CO2 as compared to remotely generated commercial power. Several of these units can be operated together to provide a higher output flexible power source using a programmable controller and models also exist with black-out start capability to provide power security when commercial power is not available. Models are also available that can operate using biogas fuels to produce renewable electrical energy and hot water.

### Overview of CP (Cogeneration Package) Micro-cogeneration System Structure



### CP series unit lineup

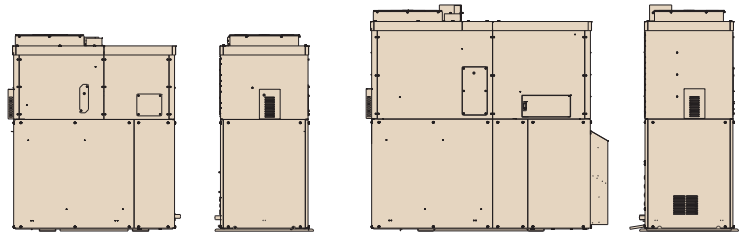
Rated power output	Model	Features	Heat recovery		
			Natural gas	LPG	Biogas
5.0kW	CP5WG1 	Standard cogeneration	9.9kW	9.9kW	-
10.0kW	CP10WG 	Standard cogeneration	17.6kW	17.5kW	-
	CP10WE1 	Flexible cogeneration	16.2kW	17.2kW	-
25.0kW	CP25WE 	Flexible cogeneration	38.4kW	39.2kW	38.7kW / 40.6kW methane 80-90% methane 60-70%

Flexible cogeneration units include an internal radiator to facilitate power led operation.



## CP MICRO GENERATION SYSTEM LINE-UP

Yanmar WE series CP micro-cogeneration units are available in 10kW and 25kW electrical power output models. This series is primarily designed for regions covered by CE marking.



### CP micro-cogeneration unit line-up

Key specifications			CP10WE1	CP2510WE
Output	Rated output (*1)	kW	10.0	25.0
	Frequency	Hz	50	
	Voltage	V	400 AC	
	Current (supplied to load per phase)	A	14.0 AC	35.4 AC
	Phases / wires	-	Three-phase / four-wire	
	Power factor	%	99 or more	97 or more
Heat recovery	Recovered heat	kW	16.2	38.4
	Hot water temperature inlet / outlet	C	65 / 70 (78 max)	80 / 85
	Hot water flow rate (*2)	L / min	47.3	110.0
Efficiency	Overall / generation / heat recovery	%	84.0 / 32.0 / 52.0	85.0 / 33.5 / 51.5
Input power supply	Supply voltage	V	230 AC	200 AC (internal)
	Average starting current	A	22.6 AC	46.0 AC
Power consumption	Fan OFF / fan ON / heater ON	kW	0.28 / 0.53 / 0.50	0.93 / 1.35 / 0.75
Fuel	Natural gas consumption LHV data (*3)	kW	31,1	74,6
	Supply pressure for natural gas	kPA	2.0	
Sound pressure	Rated load with fan OFF / ON (*4)	db(A)	54 / 56	62 / 64
Weight	Including lubricant and coolant	kg	755	1,320
Gas engine	Engine type	-	Yanmar Gas Engine	
	Specified engine lubricant	-	Yanmar genuine GHP oil	
	Specified engine coolant	-	Yanmar genuine GHP coolant	
Generator	Generator type	-	Compact and light weight permanent magnet generator	
Grid connection	Connection method	-	High efficiency inverter grid interconnection	
Servicing	Service interval	-	10,000 hours	
Operation	Operation modes	-	Flexible cogeneration with internal radiator for power led operation	

**NOTES:**

\*1) Heat recovery and efficiency values given are for rated output in standard atmospheric conditions

\*2) The maximum allowed is +5% on the value given

\*3) Tolerance of +5% is not included

\*4) Measured at 1m from unit and 1.2m above the ground in an anechoic room simulation

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



## CP MICRO GENERATION SYSTEM LINE-UP

### CP unit options

In order to allow Yanmar CP units 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 Yanmar CP units offer low noise and vibration operation, there may be cases such as in rooftop installations where it is necessary to use an anti-vibration mount when installing the unit. For each size of CP unit there is a different model of anti-vibration mount.

#### ■ Anti-salt treatment

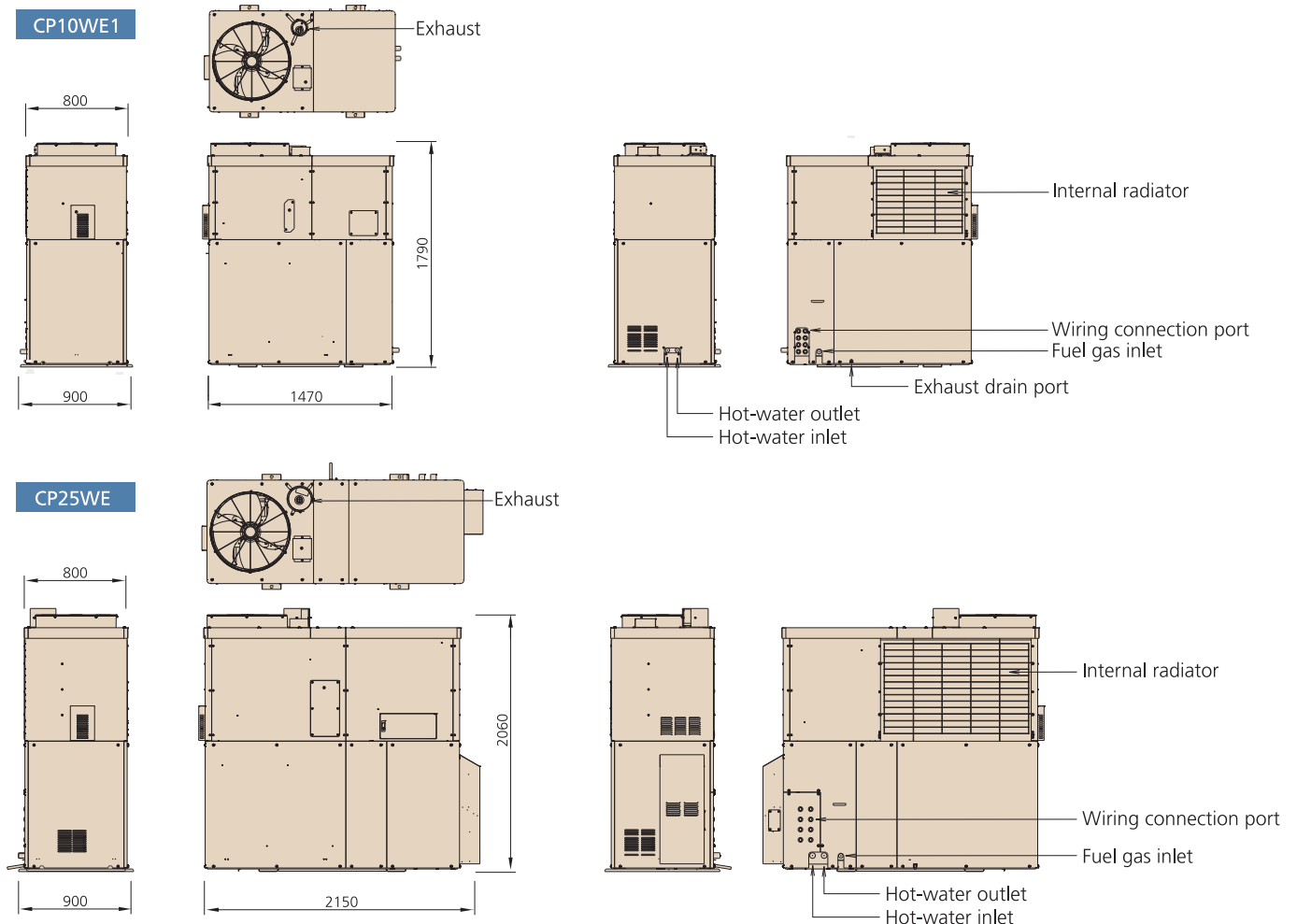
Anti-salt treatment specification is for CP units that are installed near to the sea. To avoid salt-air damage to the outdoor unit key parts are treated with protective coatings. For units exposed to direct sea breezes a further level of protection is required (anti heavy salt damage proof specification).

#### ■ Other options

Exhaust pipe extension joint, flexible exhaust pipe, drain syphon, drain filter, radiator exhaust air direction change duct, heater kit, remote monitoring adapter.

### CP unit dimensions

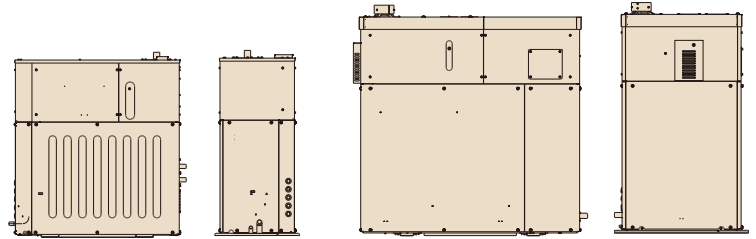
Dimensions in mm





## CP MICRO GENERATION SYSTEM LINE-UP

Yanmar WG series CP micro-cogeneration units are available in 5kW and 10kW electrical power output models. This series is primarily designed for regions covered by CE marking.



### CP micro-cogeneration unit line-up

Key specifications			CP5WG1	CP10WG
Output	Rated output (*1)	kW	5.0	10.0
	Frequency	Hz	50	
	Voltage	V	400 AC	
	Current (supplied to load per phase)	A	7.2 AC	14.0 AC
	Phases / wires	-	Three-phase / four-wire	
	Power factor	%	99 or more	
Heat recovery	Recovered heat	kW	9.9	17.6
	Hot water temperature inlet / outlet	C	60 / 80	
	Hot water flow rate (*2)	L / min	6.6	12.6
Efficiency	Overall / generation / heat recovery	%	85.0 / 28.5 / 56.5	
Input power supply	Supply voltage	V	230 AC	
	Average starting current	A	13 AC	22.6 AC
Power consumption	Rated / heater ON (below 5C)	kW	0.19 / -	
Fuel	Natural gas consumption LHV data (*3)	kW	17.5	
	Supply pressure for natural gas	kPA	2.0	
Sound pressure	Rated load with fan OFF / ON (*4)	db(A)	50	53
Weight	Including lubricant and coolant	kg	365	710
Gas engine	Engine type	-	Yanmar Gas Engine	
	Specified engine lubricant	-	Yanmar genuine GHP oil	
	Specified engine coolant	-	Yanmar genuine GHP coolant	
Generator	Generator type	-	Compact and light weight permanent magnet generator	
Grid connection	Connection method	-	High efficiency inverter grid interconnection	
Servicing	Service interval	-	10,000 hours	
Operation	Operation modes	-	Standard cogeneration (without internal radiator)	

**NOTES:**

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#### ■ Anti-salt treatment

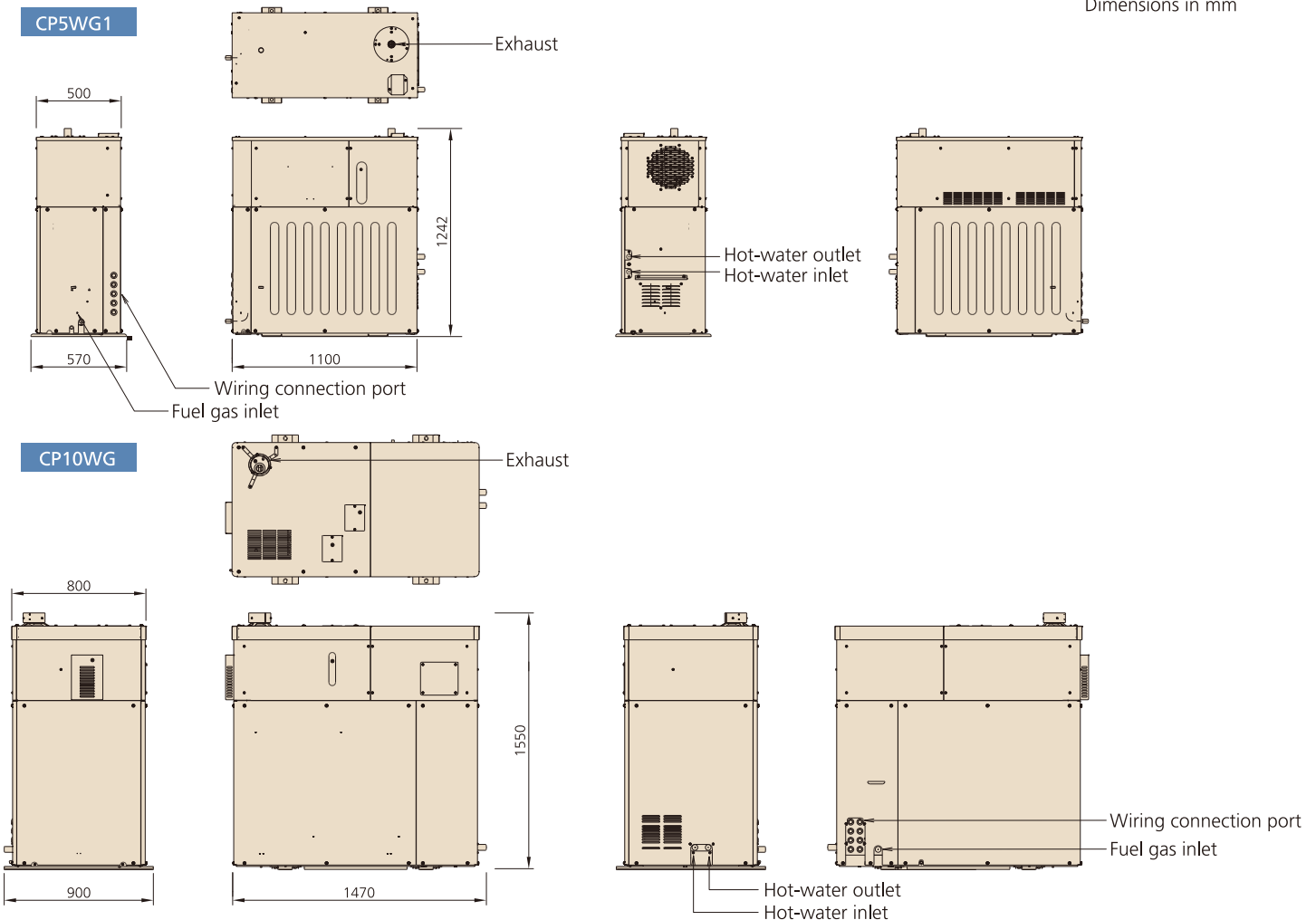
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#### ■ Other options

Exhaust pipe extension joint, flexible exhaust pipe, drain syphon, drain filter, heater kit, remote monitoring adapter.

### CP unit dimensions

Dimensions in mm





## **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, generators, 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>

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