

Vman

Driven by technology.

Built to endure.

GAS

PRODUCT CATALOG

Presented by VMAN Engine, where power meets precision.

Year **2025**
09th Edition

ABOUT VMAN ENGINE



Vman VMAN is a highly professional engine manufacturing enterprise based in Shanghai, integrating design, research and development, production, and sales into one cohesive operation. Founded in 2007, the company initially imported high-power diesel engine technology. Through continuous overseas study and the localization of parts assembly (CKD) for imported machines (CBU), VMAN has built a skilled and cohesive team.

The company consistently develops new products, adopts advanced manufacturing technologies, utilizes sophisticated production equipment, and leverages extensive production management experience and modern testing methods to establish the VMAN brand as a benchmark of excellence. Every product is strictly controlled across all stages, including

design, procurement, technology, field operations, and quality, ensuring compliance with both domestic and international standards.

VMAN's product portfolio spans from construction machinery, generator sets, marine applications, and more, covering both diesel and gas engines. The power range extends from 25 kW to 2020 kW, with future plans to expand up to 3700 kW. All engines meet Stage II and Stage III emission standards.

Headquartered in Shanghai, VMAN operates a manufacturing facility in Changzhou, China. Additionally, the company has a branch in Singapore and is planning to establish a European branch in the near future.

The **VMAN Engine** boasts a fully advanced manufacturing process and a robust quality management system. Equipped with state-of-the-art facilities and extensive experience in modern production management, we maintain a rigorous approach to part assembly and debugging to prevent leaks of gas, water, and oil. Every engine undergoes a standardized leak test to ensure the highest tightening quality. Additionally, we utilize ESTIC technology (Japanese Nut Runner Machines) for all critical bolts. Each engine is thoroughly debugged and tested before being released to the market.

Utilization of Advanced Technology

All testing equipment is imported from renowned engine manufacturers. Every engine must meet stringent technical standards during on-site trials.

Multi-Level Testing and 110% Load Testing

Each engine undergoes multi-level testing tailored to customer requirements. Additionally, it is subjected to 110% load testing, as well as sudden loading and unloading tests, to ensure the highest quality and reliability.

ISO 9001:2015 Certified Quality Management System

Our production line incorporates advanced methods, including automated delivery systems, rotary carriers, cylinder press fitting, and front-rear oil seal press fitting, to ensure precise control over production and quality.



History

2007-2009

- ▶ **Importing technology & Drawing interpretation**
Part drawing, assemble drawing, machine drawing, QA system, etc
- ▶ **Learning & Training**
5 times staff training abroad
4 times professors to our factory for guidance

2009-2014

- ▶ **CKD & CBU Diesel engines**
Getting aptitude of assembling CKD diesel engine, Match up CBU&CKD diesel engines with Customers
- ▶ **Build new factory in Shanghai**
Realize home manufacture and finish all series of V6 V8 V12 V16 engine and get excellent feedback from customers

From 2017

- ▶ **Starting international trading business**
Now had export to Korea, Taiwan, Indonesia, Algeria, Nigeria, Pakistan, Malaysia, UAE, Vietnam, Poland, Albania, Argentina and other countries.

From 2019

- ▶ **Building New Branch factory**
In ChangZhou City, Extend more power range products In particular high power engines up to 2MW.

2020-2022

- ▶ **New C & CE series Engines Launch**
Develop New C&CE series Engines and put to the market. Extend full power range from 62kW to 1100kW

From 2022

- ▶ **Set up branch in Singapore**
VMAN Engine Singapore P, Ltd set up on July.2022.. Provide technical training and service support for the global market.

2022-2023

- ▶ **Further expand the product range**
C03 series diesel engine put on the market, power range 25kW to 55kW; CET13 AND DT30 gas engine put on the market, power range 250kW to 500kW.

From 2024

- ▶ **Improvement and new product**
Launch of DE58 and DT58 series engine. Expanding power range to 2222 kW for diesel engines, and 1350kW for gas engines.



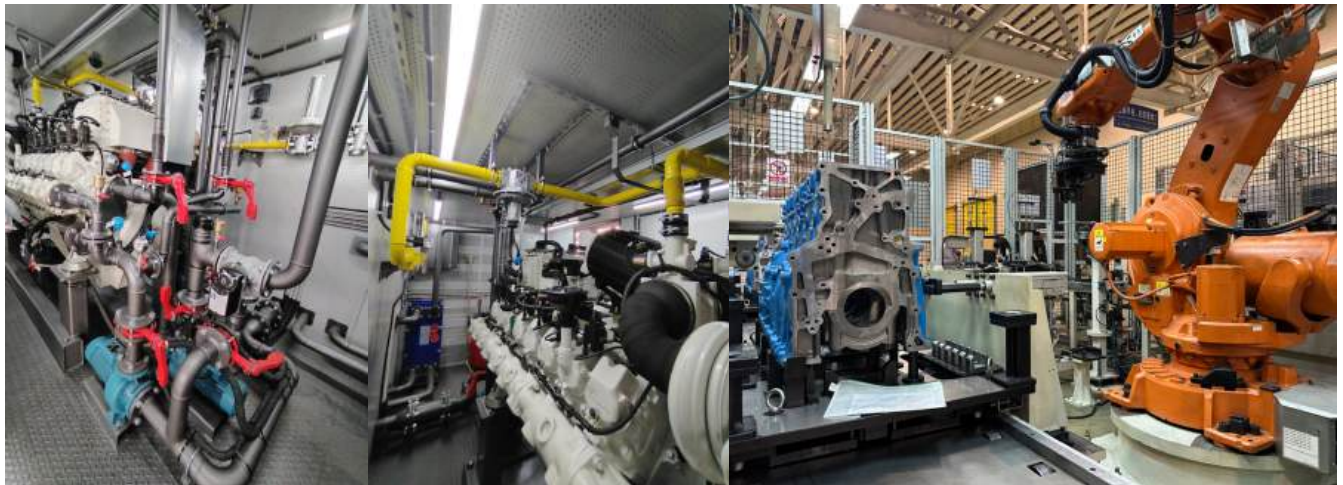
New branch factory in ChangZhou City

Gas Engine



DT series Gas engine is developed from 2018, cooperate with our Polish partner, over 5 years of research on cogeneration systems and developed their own solutions for industrial gas engines working on biogas with variable parameters, nature gas and others. By changing the construction of the engine's main parts, let them more suitable for different gas resource, enhance efficiency of engine, also enhance the parts service time to save the maintenance cost of fully service life time.

CET series Gas engine is developed by AVL , AVL is a famous engine technology consulting company in the world, headquartered in Austria. Most of main parts of engine till now still import or used famous brand product to ensure the engine highly service time less maintenance cost.



Gas Engine



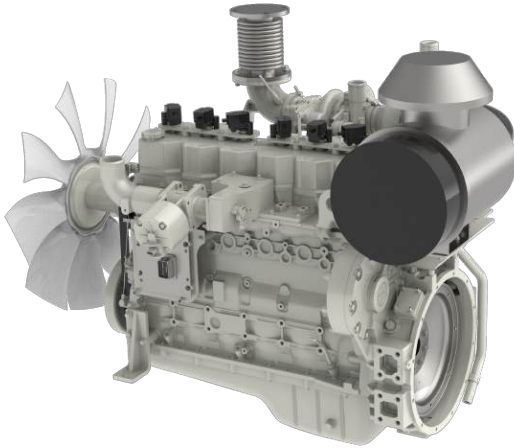
Model	Type	Speed (rpm)	Electrical power (kW)	Thermal output (kW)	Disp. (L)	Size (mm)	Flywheel
CT07A	L6	1500	100	115	6.5	1212 x 841 x 1146	SAE 3#11.5
CET13A	L6		250	282	12.80	1360 x 898 x 1138	SAE 1#14
DT22A	V12		350	411	22.61	1717 x 1392 x 1360	
DT30A	V16		500	641	30.14	2340 x 1392 x 1360	
DT58	V12	1800	1200	1231	57.2	2526 x 1781 x 2109	SAE 00# 21
CT07B	L6		100	115	6.5	1212 x 841 x 1146	SAE 3#11.5
CET13B	L6		250	282	12.80	1360 x 898 x 1138	SAE 1#14
DT22B	V12		350	411	22.61	1717 x 1392 x 1360	
DT30B	V16	500	641	30.14	2340 x 1392 x 1360		

CT07 Gas Engine

INTRODUCTION

CT series gas engine developed independently by VMAN is a classic product. It is characterized by energy-saving and environmental-friendly, excellent performance, compact structure, reliable and durable. The indexes, such as pollutant emission, dynamic performance, economy, and reliability, reach the international advanced level.

The CT07 gas engine uses Woodward gas engine control system to ensure stable and reliable engine operation



Ratings	1500rpm / 50Hz	1800rpm / 60Hz
	CT07A	CT07B
Electrical power (kW)	100	100
Thermal output (kW)	115	115
Electrical efficiency *	38.31%	38.31%
Thermal efficiency *	42.14%	42.14%
Total efficiency *	82.46%	82.46%

GENERAL ENGINE DATA

Engine Model	CT07A	CT07B
Engine Type	6 cylinder, Inline-type, Turbo charged & intercooled (air to air)	
Speed	1500 rpm	1800rpm
Bore x stroke	105 x 124 mm	
Number of valve per cylinder	4	
Displacement	6.5 L	
Compression ratio	10.5 : 1	10.5 : 1
Rotation {Looking at flywheel}	Counter clockwise {CCW}	
Firing order	1-5-3-6-2-4	
Combustion Type	W	
Controller system	Woodward PG+	
Outstanding dimension	1212 x 841 x 1146 mm	
Engine Dry Weight	560 kg	
Flywheel and flywheel housing	SAE 11.5# flywheel	
	SAE 3# flywheel housing	

- Note: All data of gas generator sets are measured under the test environment: Methane volume content $\geq 95\%$, Gas temperature 10-40 °C, Gas humidity $< 60\%$, Negative pressure of air intake $> -3\text{kPa}$, Exhaust back pressure $< 5\text{kPa}$, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity $\leq 30\%$, Altitude $\leq 1000\text{m}$

CT07 Gas Engine

GAS CONSUMPTION CALCULATION

Engine Model	CT07A		CT07B	
Fuel	Nature Gas			
Fuel Consumption of generator set				
	kW	Nm ³ /h	kW	Nm ³ /h
100%	100	26	100	26
50%	50	15	50	15

-Standard reference conditions: ; Atmospheric pressure 100kPa, intake temperature 25°, relative humidity 50%. The deviation range of the data is +/-4%.

INTAKE & EXHAUST SYSTEM

Engine Model	CT07A	CT07B
Max.Exhaust Back Pressure (kPa)	10	10
Max.Exhaust Temp.(After Turbo°C)	590	590
Max.Exhaust Flow (Nm ³ /h)	478	478
Max.Intake Gas Flow (Nm ³ /h)	27.5	27.5
Max.Intake Air Flow (Nm ³ /h)	450	450
Max.Intake Resistance (Clean filter) (kPa)	2.5	2.5
Max.Intake Resistance (Dirty filter) (kPa)	6	6
Alarm Value of Intake Resistance (kPa)	5.5	5.5

COOLING SYSTEM

	(Ethylene Glycol, water)	(Ethylene Glycol, water)
Coolant main content	(Ethylene Glycol, water)	(Ethylene Glycol, water)
Coolant outlet Temperature	90°C	90°C
Temperature Difference with inlet & outlet	6 ±1°C	5 ±1°C
Max.Coolant warning Temperature	95 °C	95 °C
Radiator Flow	252 L/min	277 L/min
Intake air type	Air to air intercooler	Air to air intercooler
Intercooler allowance press drop	8 kPa	8 kPa
Intercooler Heat release	19 kW	19 kW
Intercooler allowance intake temperature	195 ±5°C	195 ±5°C

ELECTRICAL SYSTEM

Charging Alternator Voltage	24V	24V
Unaided Cold Start Average Start Speed	130 r/min	130 r/min
Starting aid (Option)	Block heater (Min. Temperature for Unaided)	Block heater (Min. Temperature for Unaided)

CT07 Gas Engine

LUBRICATION SYSTEM

Lube oil pressure @ idle speed	Min 80 ±10 kPa	Min 80 ±10 kPa
Lube oil pressure @ rated speed	350 ±10 kPa	350 ±10 kPa
Max. Permissible Oil Temperature	115 °C	115 °C
Oil consumption rate	< 0.25 g/kWh	< 0.25 g/kWh
Oil capacity	18 L	18 L

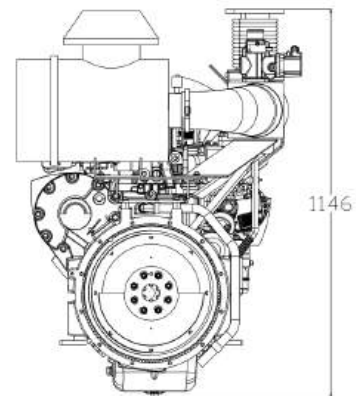
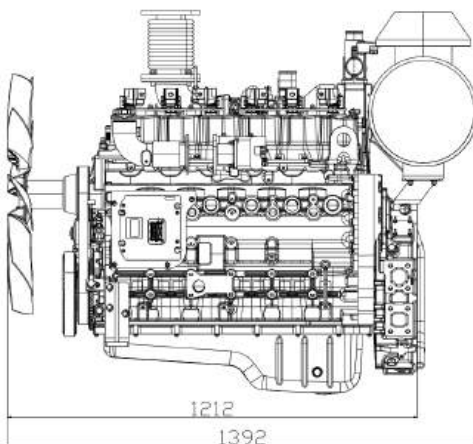
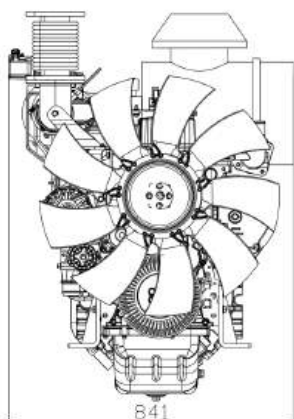
OIL SELECTION RECOMMENDATIONS

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	MOBIL	MOBIL PEGASUS 805 SAE40

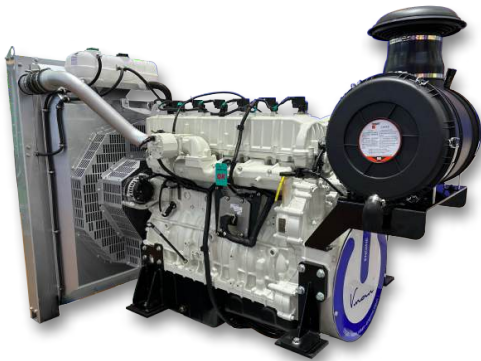
EXHAUST

Item	CT07A	CT07B
CH ₄	1069.5 ppm	1069.5 ppm
O ₂	≤ 5%	≤ 5%
N ₂	73% - 77%(Standard values)	73% - 77%(Standard values)
CO ₂	64900 ppm	64900 ppm
NO _x	500mg/Nm ³ @ 5% O ₂	500mg/Nm ³ @ 5% O ₂
SO ₂	From your natural gas	From your natural gas
CO	705 ppm	705 ppm
DUST	From your local air	From your local air

CT07 SERIES GAS ENGINE DRAWING



CET13 Gas Engine



INTRODUCTION

CET series engine developed independently by VMAN is a classic product. It is characterized by energy-saving and environmental-friendly, excellent performance, compact structure, reliable and durable. The indexes, such as pollutant emission, dynamic performance, economy, and reliability, reach the international advanced level. The engine basically adopt new technology of Overhead camshaft. All main parts are imported.

Such as engine block, crankshaft, piston, Connecting rod, starting motor, bolt are all imported from Germany. Valve, turbocharger, charging alternator are all imported from U.S.A.

The engine design, component development, complete test validation came from AVL, AVL is a famous engine technology consulting company in the world, headquartered in Austria.

Ratings	1500rpm / 50Hz	1800rpm / 60Hz
	CET13A	CET13B
Electrical power (kW)	250	250
Thermal output (kW)	282	282
Electrical efficiency *	38.40%	38.40%
Thermal efficiency *	43.30%	43.30%
Total efficiency *	81.70%	81.70%

GENERAL ENGINE DATA

Engine Model	CET13A	CET13B
Engine Type	6 cylinder, Inline-type, Four- stroke	
Speed	1500 rpm	1800 rpm
Bore x stroke	CET13: 130mm x 161mm	
Number of valve per cylinder	4	
Displacement	12.82 L	12.82 L
Compression ratio	11.5 : 1	11.5 : 1
Rotation {Looking at flywheel}	Anti-clockwise (facing the power delivery end)	
Firing order	1-5-3-6-2-4	
Cylinder distance	162 mm	
Combustion Type	W	
Controller system	Woodward PG+	
Outstanding dimistation	2000 x 946 x 1557 mm	
Engine Dry Weight	1183kg	
Rotational Inertia	2.9 kgm ²	
Flywheel and flywheel housing	SAE 14" flywheel	
	SAE 1# flywheel housing	

- Note: All data of gas generator sets are measured under the test environment: Methane volume content $\geq 95\%$, Gas temperature 10-40 °C, Gas humidity $< 60\%$, Negative pressure of air intake $> -3kPa$, Exhaust back pressure $< 5kPa$, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity $\leq 30\%$, Altitude $\leq 1000m$

CET13 Gas Engine

GAS CONSUMPTION CALCULATION

Engine Model	CET13A / CET13B	
Fuel	Nature Gas	
Fuel Consumption of generator set		
	kW	Nm ³ /h
100%	250	65
50%	125	36

-Standard reference conditions: ; Atmospheric pressure 100kPa, intake temperature 25°, relative humidity 50%. The deviation range of the data is +/-4%.

INTAKE & EXHAUST SYSTEM

Engine Model	CET13A / CET13B	
Max.Exhaust Back Pressure (kPa)	10±1	
Max.Exhaust Temp.(After Turbo°C)	580	
Max.Exhaust Flow (Nm ³ /h)	1165	
Max.Intake Gas Flow (Nm ³ /h)	65	
Max.Intake Air Flow (Nm ³ /h)	1100	
Max.Intake Resistance (Clean filter) (kPa)	3.5	
Max.Intake Resistance (Dirty filter) (kPa)	6.5	
Alarm Value of Intake Resistance (kPa)	6.3	

COOLING SYSTEM

Engine Model	CET13A	CET13B
Coolant main content	50 : 50 (Ethylene Glycol, water)	
Coolant outlet Temperature	95°C	
Temperature Difference with inlet & outlet	6 ±1°C	
Max.Coolant warning Temperature	104 °C	
Radiator Flow	533 m ³ /min	670 m ³ /min
Intake air type	Air to air intercooler	
Intercooler allowance press drop	11 - 13 kPa	
Intercooler Heat release	62 kW	
Intercooler allowance intake temperature	195 ±5°C	

ELECTRICAL SYSTEM

Charging Alternator Voltage	24V
Unaided Cold Start Average Start Speed	130 r/min
Starting aid (Option)	Block heater (Min. Temperature for Unaided)

CET13 Gas Engine

LUBRICATION SYSTEM

Lube oil pressure @ idle speed	Min 100 ±10 kPa
Lube oil pressure @ rated speed	550±10 kPa
Max.Permissible Oil Temperature	120 °C
Oil capacity	33.2-41.6 L

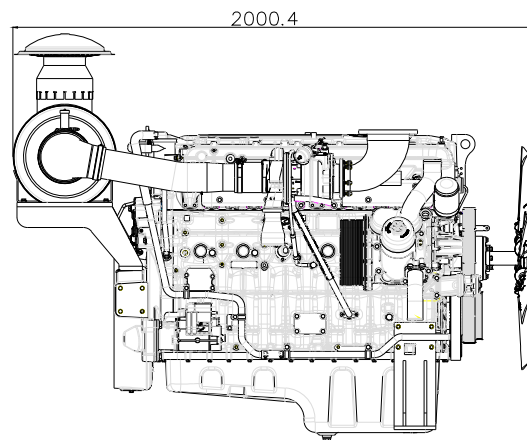
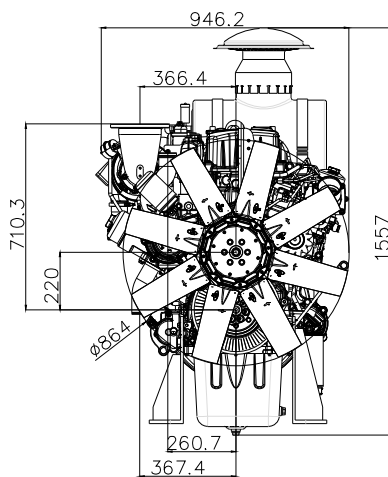
OIL SELECTION RECOMMENDATIONS

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	Mobil	MOBIL PEGASUS 805 SAE40

EXHAUST

Item	CET13(Value)
CH ₄	1069.5 ppm
O ₂	≤5%
N ₂	73%-77%(Standard values)
CO ₂	70654.63 ppm
NO _x	500mg/Nm ³ @ 5% O ₂
SO ₂	From your natural gas
CO	705 ppm
DUST	From your local air

CET13 SERIES GAS ENGINE DRAWING



DT22 Gas Engine

INTRODUCTION

The VMAN DT22 series is a European Union CE-certified natural gas engine developed from the block up to be a reliable and durable power unit. Built upon a proven European diesel grade block, the 12-cylinders V-configuration, turbocharged and after-cooled engine features replaceable wet liners and water-cooled exhaust.

Superior engine performance is driven by Woodward control system, ECU that integrates and coordinates all critical functions including: governor, Variable ignition timing, Air fuel ratio control, Knock suppression and engine protection.



Ratings	1500rpm / 50Hz	1800rpm / 60Hz
	DT22A	DT22B
Electrical power (kW)	350	350
Thermal output (kW)	411	411
Electrical efficiency *	38.08%	38.08%
Thermal efficiency *	44.68%	44.68%
Total efficiency *	82.76%	82.76%

GENERAL ENGINE DATA

Engine Model	DT22A	DT22B
Engine Type	12 cylinder, Inline-type, Four- stroke	
Speed	1500 rpm	1800 rpm
Bore x stroke	130 x 142 mm	
Number of valve per cylinder	2	
Displacement	22.61L	
Compression ratio	12.5 : 1	12.5 : 1
Rotation {Looking at flywheel}	Counter clockwise {CCW}	
Firing order	1-12-5-8-3-10-6-7-2-11-4-9	
Combustion Type	W	
Controller system	Woodward PG+	
Outstanding dimension	1552 x 1252.5 x 1320 mm	
Engine Dry Weight	1575 kg	
Rotational Inertia	2.9 kgm ²	
Flywheel and flywheel housing	SAE 14" flywheel	
	SAE 1#flywheel housing	

- Note: All data of gas generator sets are measured under the test environment: Methane volume content $\geq 95\%$, Gas temperature 10-40 °C, Gas humidity $< 60\%$, Negative pressure of air intake $> -3\text{kPa}$, Exhaust back pressure $< 5\text{kPa}$, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity $\leq 30\%$, Altitude $\leq 1000\text{m}$

DT22 Gas Engine

GAS CONSUMPTION CALCULATION

Engine Model	DT22A		DT22B	
Fuel	Nature Gas			
Fuel Consumption of generator set				
	kW	Nm ³ /h	kW	Nm ³ /h
100%	350	92	350	92
50%	175	53	175	53

INTAKE & EXHAUST SYSTEM

Max.Exhaust Back Pressure (kPa)	10
Max.Exhaust Temp.(After Turbo°C)	480
Max.Exhaust Flow (kg/h)	1773
Max.Intake Gas Flow (m ³ /h)	93
Max.Intake Air Flow (kg/h)	1704
Max.Intake Resistance (Clean filter) (kPa)	5
Max.Intake Resistance (Dirty filter) (kPa)	6.5
Alarm Value of Intake Resistance (kPa)	6.3

COOLING SYSTEM

Coolant main content	50 : 50 (Ethylene Glycol, water)
Coolant outlet Temperature	95°C
Temperature Difference with inlet & outlet	11 ± 1°C
Max.Coolant warning Temperature	97 °C
Radiator Heat release	279 kW
Radiator Flow	840 L/min
Intake air type	Air to air intercooler
Intercooler allowance press drop	11 - 13 kPa
Intercooler Heat release	81 kW
Intercooler allowance intake temperature	195 ± 5°C

DT22 Gas Engine

LUBRICATION SYSTEM

Lube oil pressure @ idle speed	Min 160 ± 10 kPa
Lube oil pressure @ rated speed	450 ± 10 kPa
Max. Permissible Oil Temperature	110 °C
Oil capacity	57 L

OIL SELECTION RECOMMENDATIONS

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	Mobil	MOBIL PEGASUS 805 SAE40

ELECTRICAL SYSTEM

Charging Alternator Voltage	24V
Unaided Cold Start Average Start Speed	130 r/min
Starting aid (Option)	Block heater (Min. Temperature for Unaided)

EXHAUST

CH ₄	1069.5 ppm
O ₂	≤ 5%
N ₂	73%-77% (Standard values)
CO ₂	70654.63 ppm
NO _x	500mg/Nm ³ @ 5% O ₂
SO ₂	From your natural gas
CO	705 ppm
DUST	From your local air

DT22 Gas Engine

Engine Coolant

When choosing water as cooling medium, the following requirements should be met:

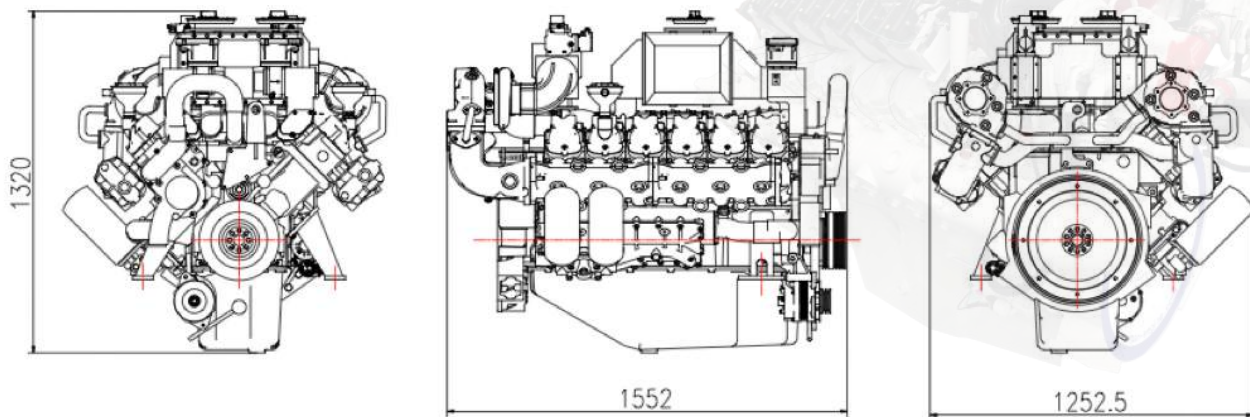
- A. Use clean water that is slightly alkaline and does not contain corrosive compounds;
- B. The hardness is 0.7-5.3 mol/L, the content of chloride ion is less than 150mg/L, and the PH value is 6.0-8.5;
- C. If the water quality does not meet the above requirements, the corresponding softening water equipment or descaling equipment should be added according to the coefficient of 1.2 times of the consumption of cooling water.

Other cooling medium

When the ambient temperature is below 5°C, antifreeze should be selected as the cooling medium.

When selecting antifreeze, the freezing point should be 5°C lower than the lowest temperature in the use area.

DT22 SERIES GAS ENGINE DRAWING



DT30 Gas Engine

INTRODUCTION

The VMAN DT30 series is a European Union CE-certified natural gas engine developed from the block up to be a reliable and durable power unit. Built upon a proven European diesel grade block, the 6-cylinders V-configuration, turbocharged and after-cooled engine features replaceable wet liners and water-cooled exhaust.

Superior engine performance is driven by Woodward control system, ECU that integrates and coordinates all critical functions including: governor, Variable ignition timing, Air fuel ratio control, Knock suppression and engine protection.



Ratings	1500rpm / 50Hz	1800rpm / 60Hz
	DT30A	DT30B
Electrical power (kW)	500	500
Thermal output (kW)	641	641
Electrical efficiency *	38.08%	38.08%
Thermal efficiency *	48.85%	48.85%
Total efficiency *	86.93%	86.93%

GENERAL ENGINE DATA

Engine Model	DT30A	DT30B
Engine Type	16 cylinder, V-type, Four- stroke	
Speed	1500 rpm	1800 rpm
Bore x stroke	130 x 142 mm	
Number of valve per cylinder	2	
Displacement	30.14 L	
Compression ratio	12.5 : 1	12.5 : 1
Rotation {Looking at flywheel}	Counter clockwise {CCW}	
Firing order	1-15-6-12-8-5-16-7-11-4-9-2-14-10-3-13	
Combustion Type	W	
Controller system	Woodward PG+ / ComAp	
Outstanding dimistation	1887 x 1120 x 1362 mm	
Engine Dry Weight	2100 kg	
Rotational Inertia	2.9 kgm ²	
Flywheel and flywheel housing	SAE 14" flywheel	
	SAE 1# flywheel housing	

- Note: All data of gas generator sets are measured under the test environment: Methane volume content $\geq 95\%$, Gas temperature 10-40 °C, Gas humidity $< 60\%$, Negative pressure of air intake $> -3kPa$, Exhaust back pressure $< 5kPa$, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity $\leq 30\%$, Altitude $\leq 1000m$

DT30 Gas Engine

GAS CONSUMPTION CALCULATION

Engine Model	DT30A		DT30B	
Fuel	Nature Gas			
Fuel Consumption of generator set				
	kW	Nm ³ /h	kW	Nm ³ /h
100%	500	132	500	132
50%	250	76	250	76

-Standard reference conditions: ; Atmospheric pressure 100kPa, intake temperature 25°, relative humidity 50%.
The deviation range of the data is +/-4%.

INTAKE & EXHAUST SYSTEM

Engine Model	DT30A	DT30B
Max.Exhaust Back Pressure (kPa)	10	10
Max.Exhaust Temp.(After Turbo°C)	480	480
Max.Exhaust Flow (kg/h)	3045	3045
Max.Intake Gas Flow (m ³ /h)	140	140
Max.Intake Air Flow (m ³ /h)	2200	2200
Max.Intake Resistance (Clean filter) (kPa)	5	5
Max.Intake Resistance (Dirty filter) (kPa)	6.5	6.5
Alarm Value of Intake Resistance (kPa)	6.3	6.3

COOLING SYSTEM

	50 : 50 (Ethylene Glycol, water)	50 : 50 (Ethylene Glycol, water)
Coolant main content	50 : 50 (Ethylene Glycol, water)	50 : 50 (Ethylene Glycol, water)
Coolant outlet Temperature	95°C	95°C
Temperature Difference with inlet & outlet	12 ±1°C	12 ±1°C
Max.Coolant warning Temperature	97 °C	97 °C
Radiator Heat release	407 kW	407 kW
Radiator Flow	1040L/min	1040L/min
Intercooler allowance press drop	11 - 13 kPa	11 - 13 kPa
Intercooler Heat release	116 kW	116 kW
Intercooler allowance intake temperature	195 ±5°C	195 ±5°C
Max.Intercooler intake air	2838 kg/h	2838 kg/h

DT30 Gas Engine

LUBRICATION SYSTEM

Lube oil pressure @ idle speed	Min 160 ± 10 kPa	Min 160 ± 10 kPa
Lube oil pressure @ rated speed	450 ±10 kPa	450 ±10 kPa
Max.Permissible Oil Temperature	110 °C	110 °C
Oil capacity	65-70 L	65-70 L

OIL SELECTION RECOMMENDATIONS

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	Mobil	MOBIL PEGASUS 805 SAE40

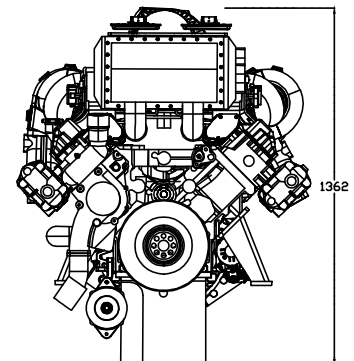
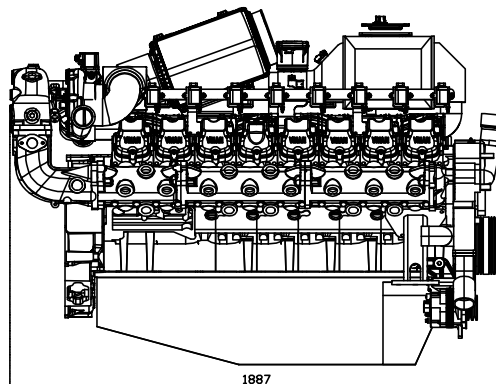
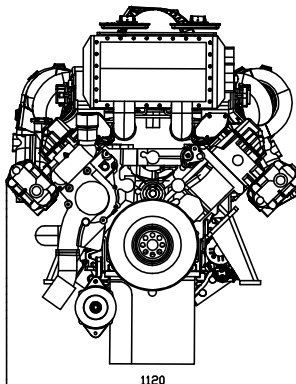
ELECTRICAL SYSTEM

Charging Alternator Voltage	24V	24V
Unaided Cold Start Average Start Speed	130 r/min	130 r/min
Starting aid (Option)	Block heater (Min. Temperature for Unaided)	Block heater (Min. Temperature for Unaided)

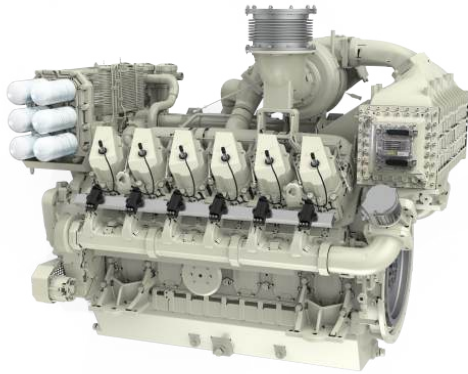
EXHAUST

Item	DT30A	DT30B
CH ₄	1069.5 ppm	1069.5 ppm
O ₂	≤5%	≤5%
N ₂	73%-77% (Standard values)	73%-77% (Standard values)
CO ₂	70654.63 ppm	70654.63 ppm
NO _x	500mg/Nm ³ @ 5% O ₂	500mg/Nm ³ @ 5% O ₂
SO ₂	From your natural gas	From your natural gas
CO	705 ppm	705 ppm
DUST	From your local air	From your local air

DT30 SERIES GAS ENGINE DRAWING



DT58 Gas Engine



INTRODUCTION

DT series gas engine developed independently by VMAN is a classic product. It is characterized by energy-saving and environmental-friendly, excellent performance, compact structure, reliable and durable. The indexes, such as pollutant emission, dynamic performance, economy, and reliability, reach the international advanced level.

The DT58 gas engine uses Woodward gas engine control system to ensure stable and reliable engine operation

Engine Technical Parameter

ITEM	UNIT	VALUE
Model		DT58
Rated power	kW	1350
Quantity of cylinders	PCS	12
Cylinder bore	mm	170
Stroke	mm	210
Displacement	L	57.2
Speed	rpm	1500
Compression ratio		11.5 : 1
Mean effective pressure	MPa	1.54
Mean speed of piston	m/s	10.5
Oil capacity	L	300
Cooling water capacity	L	200
Dimension(L*W*H)	mm	2526 × 1781 × 2109
Dry weight	kg	7610
Moment of inertia of an area(flywheel)	kgm ²	12
Direction of rotation		CCW (Look at the flywheel)
Fly wheel		SAE 21
Fly wheel housing		SAE 00#
EMC		N (By VDE0857)
Starter	kW	2×8.5 @DC24V

DT58 Gas Engine

Heat Balance List of Generator Set

ITEM	UNIT	VALUE
Gas energy	kW	2898
Electrical power	kW	1200
Thermal output	kW	1231
Electrical efficiency	/	41.41%
Thermal of jacket water	kW	567
Exhaust thermal *	kW	664
Thermal efficiency	/	42.48%
Total efficiency	/	83.89%

*Exhaust gas cooled to 120 °C for natural gas. - Note: All data of gas generator sets are measured under the test environment: Methane volume content $\geq 95\%$, Gas temperature 10-40 °C, Gas humidity $< 60\%$, Negative pressure of air intake $> -3\text{kPa}$, Exhaust back pressure $< 5\text{kPa}$, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity $\leq 30\%$, Altitude $\leq 1000\text{m}$

Lubricating Oil System

ITEM	UNIT	VALUE
Lubricating oil system volume	L	300
Max oil temperature	°C	105
Oil consumption rate	g/kWh	≤ 0.25

Intake & Exhaust System

ITEM	UNIT	VALUE
Exhaust temperature	°C	≤ 580
Max Exhaust temperature	°C	620
Exhaust flow (including H2O)	kg/h	5949
Exhaust capacity (including H2O)	Nm ³ /h	5055
Max Exhaust back pressure	kPa	2.5
Diameter of exhaust pipe		DN250
Combustion air flow	kg/h	5731
Max.Intake Resistance (Clean filter) (kPa)	kPa	2.5

DT58 Gas Engine

Gas System

ITEM	UNIT	VALUE
Gas type		Natural gas
CH4	%	≥80
Methane number (MN)	/	≥80
Gas valve group inlet pressure	kPa	30-50
Engine inlet gas pressure	kPa	6-10
Rate of gas pressure change	kPa/sec	≤ 1
Rate of change of heating value of gas	%/min	≤ 2
H2S	mg/Nm ³	≤ 20
All of the sulfur	mg/Nm ³	≤ 200
Solidparticle	μm/m ³	≤ 5
	mg/m ³	≤ 30

Cooling System

ITEM	UNIT	VALUE
High temperature part heat dissipation	kW	567
Low temperature part heat dissipation	kW	240
Water flow of engine cylinder liner	m ³ /h	65
Water flow of Intercooler	m ³ /h	65
High temperature water I/O	°C	83 to 90
Low temperature water I/O	°C	43 to 46
Max.water temperature of cylinder liner	°C	90
Water I/O pipe of cylinder liner	DN/PN	DN100/PN16
Water I/O pipe of Intercooler	DN/PN	DN100/PN16
High temperature water pressure	MPa	0.28
Low temperature water pressure	MPa	0.21

Engine Emission Data

ITEM	UNIT	VALUE
NOx (5%O2)	mg/Nm ³	≤500
CO (5%O2)	mg/Nm ³	≤1006
HC (5%O2)	mg/Nm ³	≤132.7
O2	%	8
λ	/	1.5

DT58 Gas Engine

Oil Selection Recommendations

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	Mobil	MOBIL PEGASUS 805 SAE40

Engine Coolant

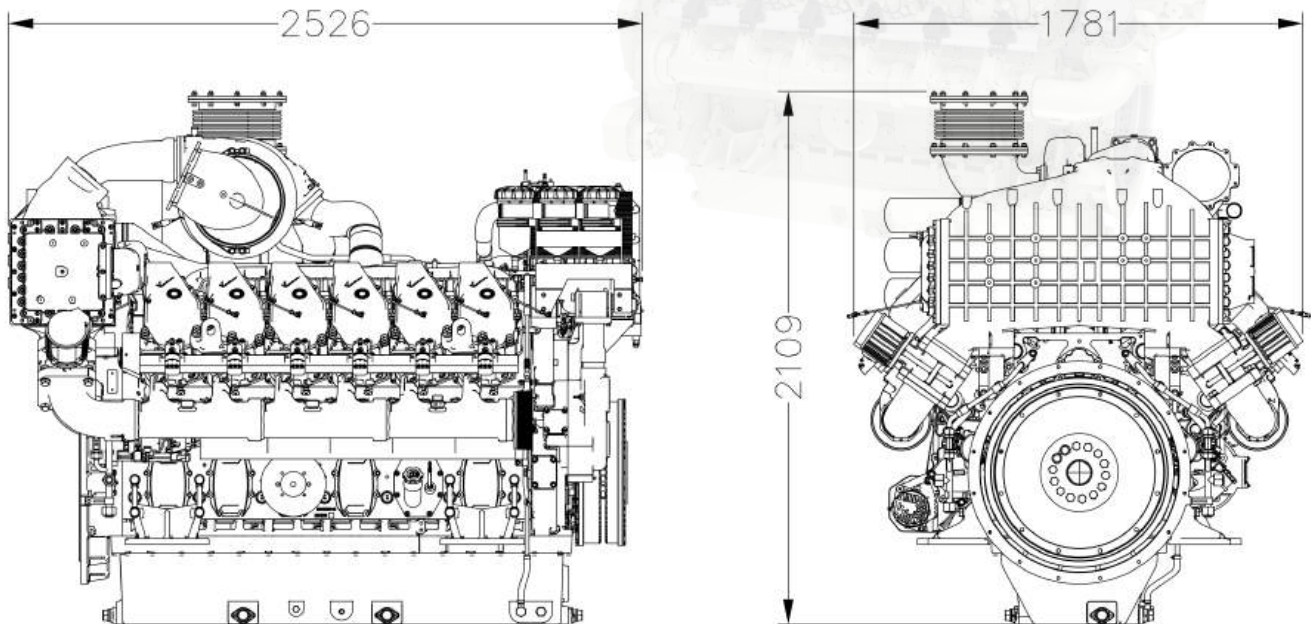
When choosing water as cooling medium, the following requirements should be met:

- A. Use clean water that is slightly alkaline and does not contain corrosive compounds;
- B. The hardness is 0.7-5.3 mol/L, the content of chloride ion is less than 150mg/L, and the PH value is 6.0-8.5;
- C. If the water quality does not meet the above requirements, the corresponding softening water equipment or descaling equipment should be added according to the coefficient of 1.2 times of the consumption of cooling water.

Other cooling medium

When the ambient temperature is below 5°C, antifreeze should be selected as the cooling medium. When selecting antifreeze, the freezing point should be 5°C lower than the lowest temperature in the use area.

DT58 (V12) SERIES GAS ENGINE DRAWING



1MW-2MW Gas Engine



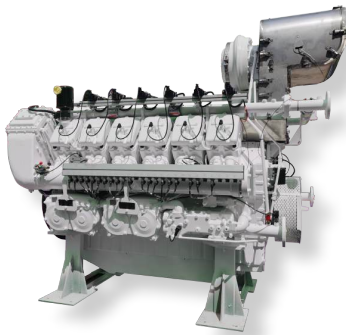
Military quality gas engine



HND Gas Engine on the basis of the licensed technology from MWM Company (Germany) , started produced MWM 234 series diesel engines which type V6, V8 and V12, MWM604BL6 series diesel engines and TBD620 series V8, V12 and V16 diesel engines. In 2007,HND obtained the license of manufacturing L16/24 and L21/31 engines from MAN B&W Co., and start mass production in 2008. At present, diesel engine power range from 110kW to 2336kW.

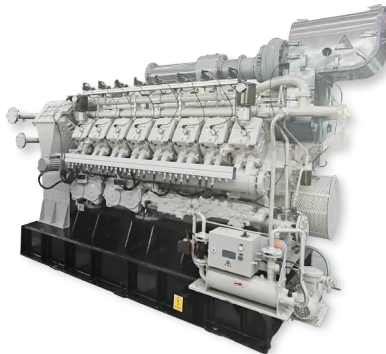
In 2005, HND company researched and developed gas engines with its own intellectual property which technology on the basis of the MWM TBD620 diesel engine. Now which products contain CHG620L6, CHG620V8, CHG620V12,CHG620V16 and CHG622V20, 5 series gas engines, gas engines power range from 550kW to 2000kW and gas generator power range from 500kW to 2000kW.

- Advanced turbocharged, intercooler, four-stroke V-type gas engine adopts the same technology as the most advanced international gas engine.
- V-type gas engine, cylinder arrangement with 90 ° angle easily for repairing and maintenance.



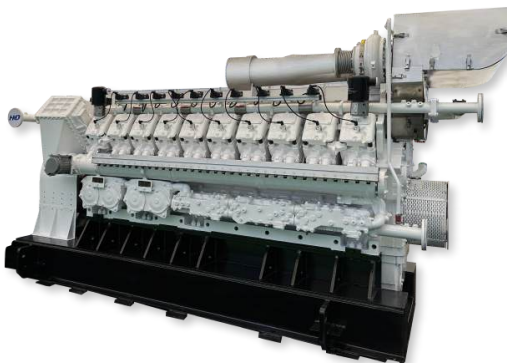
CHG620V12

Electrical power: 1000kW
 Thermal output: 1097kW
 Electrical efficiency: >40.38 %
 Thermal efficiency: >44.29 %
 Total efficiency: >84.68 %
 Gas consumption: 248 (Hu = 35.88MJ/m3)
 Oil consumption rate: ≤0.25 g/kWh
 First Overhaul / Maintenance: 60000H/500H
 NOx (5%O2) : ≤500 mg/Nm³



CHG622V16

Electrical power: 1500kW
 Thermal output: 1705kW
 Electrical efficiency: >41.08 %
 Thermal efficiency: >46.70%
 Total efficiency: >87.78 %
 Gas consumption : 366 (Hu = 35.88MJ/m3)
 Oil consumption rate: ≤0.25 g/kWh
 First Overhaul / Maintenance : 60000H/500H
 NOx (5%O2) : ≤500 mg/Nm³



CHG622V20

Electrical power: 2000kW
 Thermal output: 2215kW
 Electrical efficiency: >41.3 %
 Thermal efficiency: >45.75 %
 Total efficiency: >87.04 %
 Gas consumption : 486 (Hu = 35.88MJ/m3)
 Oil consumption rate: ≤0.25 g/kWh
 First Overhaul / Maintenance : 60000H/500H
 NOx (5%O2) : ≤500 mg/Nm³

Standard Configuration

<p>Engine and block: nodular cast iron the tensile strength can reach 120kgf / m², and it has good toughness.</p>	<p>Engine body and cylinder head are made by nodular cast iron. Strong ability to bear mechanical load. Globular gold has less cracking effect on the metal matrix, It can make cast iron strength reach 70 ~ 90% of the matrix structure strength, the tensile strength can reach 120kgf / m², and it has good toughness.</p>
<p>Moving Parts: 42CrMoA alloy steel. Enhance the life of moving parts reach 100,000 hours.</p>	<p>Crankshaft, camshaft and other moving parts are made of 42CrMoA alloy steel. It has a higher fatigue limit and resistance to multiple impacts after treatment, good impact toughness and outstanding wear resistance. Will adopt whole forging to retain the internal natural state of the metal, greatly improves the crankshaft strength, and enhances the crankshaft wear resistance used special heat treatment. This crankshaft will be increased more than 20% strength, enhance the life of moving parts reach 100,000 hours.</p>
<p>Inlet & exhaust valves valve seats: MAERKISCHES WERK GMBH</p>	<p>HND gas Engine used original imported German inlet & exhaust valves and valve seats (MAERKISCHES WERK GMBH). The service life of inlet & exhaust valves and valve seats of HND gas engines are much longer than similar domestic products. The patented rotary air valve technology is used in fitting between the intake & exhaust valve with their valve seats. Valves and valve seat are continuously grinding during the operation of engines, let sealing surface between the two always fitted, it will double extend valves life time and rejecting "pre-ignition" and "post-ignition" of the gas engines.</p>
<p>Gas system (NGL): DUNGS</p>	<p>Gas system (NGL) includes pressure reducing valves, solenoid shut-off valves, manual shut-off valves, filters and other equipment, which are installed according to different project. The main valves of the gas transmission system adopt original German DUNGS products, DUNGS has Vibration tested combination controls Multi block and Gas Bloc according US Military Standard MIL-STD-810G/31. Worldwide support via DUNGS branches and subsidiaries in more than 50 countries.</p>
<p>Turbo-chargers</p>	<p>HND gas engine is equipped with two original imported ABB TPS series Turbo-chargers to provide strong power for the engine.</p>
<p>Monitoring system</p>	<p>Heinzmann</p>
<p>Ignition Controller</p>	<p>Heinzmann IC-20</p>
<p>Air-Fuel ratio control system</p>	<p>Heinzmann XIOS-UC2</p>
<p>Knock control system</p>	<p>Heinzmann KC-01</p>



CHG620V12 Gas Engine

1. Engine technical parameter list

ITEM	UNIT	VALUE
Model		CHG620V12
Rated power	kW	1080
Quantity of Cylinders	PCS	12
Cylinder bore	mm	170
Stroke	mm	195
Displacement	L	53.1
Speed	rpm	1500
Compression ratio		12:1
mean effective pressure	MPa	1.63
mean speed of piston	m/s	9.75
Oil capacity	L	180
Cooling water capacity	L	100
Dimension(L*W*H)	mm	2775×1435×2055
Dry weight	kg	5000
Weight with oil	kg	5251
Moment of inertia of an area(flywheel)	kgm ²	6.69
Direction of rotation		CCW(Look at the flywheel)
Fly wheel		SAE21
EMC		N (By VDE0857)
Starter	kW	1×9 @DC24V

2. Heat balance list of generator set

ITEM	UNIT	VALUE
Electrical energy	kW	1000
Gas energy	kW	2476
Electrical efficiency	/	40.38%
Exhaust thermal *	kW	568
Water thermal of cylinder liner	kW	529
Thermal efficiency	/	44.29%
Total efficiency	/	84.68%

*Exhaust gas cooled to 120 °C for natural gas. - Note: All data of gas generator sets are measured under the test environment: Methane volume content ≥95%, Gas temperature 10-40 °C, Gas humidity <60%, Negative pressure of air intake >-3kPa, Exhaust back pressure <5kPa, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity ≤30%, Altitude ≤1000m

CHG620V12 Gas Engine

3. Combustion air and exhaust data sheet for engine

ITEM	UNIT	VALUE
Exhaust temperature	°C	≤580
Max Exhaust temperature	°C	620
Exhaust flow (including H2O)	kg/h	5083
Max Exhaust back pressure	kPa	2.5
Diameter of exhaust pipe		DN250
Combustion air flow	kg/h	4897
Max air pressure before air filter	kPa	2.5

4. Gas consumption data sheet

ITEM	UNIT	VALUE
Gas type		Natural gas
CH4	%	≥80
Methane number (MN)	/	≥80
Gas valve group inlet pressure	kPa	30-50
Engine inlet gas pressure	kPa	6~10
Rate of gas pressure change	Kpa/sec	1
Rate of change of heating value of gas	≤	2%/min
Gas intake pipe	Mm	100
H2S	≤	20mg/Nm3
All of the sulfur	≤	200mg/Nm3
Solidparticle	≤	5μm and 30mg/m3

5. Technical parameters of engine lubricating oil system

ITEM	UNIT	VALUE
Lubricating oil system volume	L	180
Max oil temperature	°C	90
Oil consumption rate	g/kWh	≤0.25

CHG620V12 Gas Engine

6. Technical parameters of engine cooling system

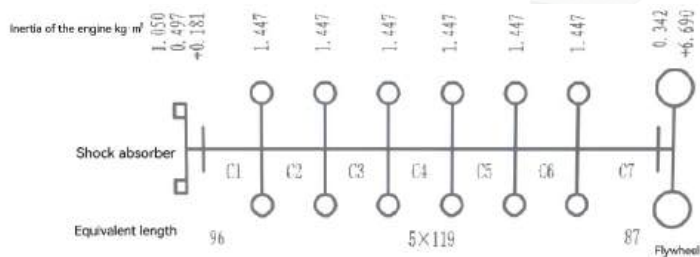
ITEM	UNIT	VALUE
High temperature part heat dissipation	kW	529
Low temperature part heat dissipation	kW	171
Flow of jacket water	m ³ /h	65
Flow of Intercooler water	m ³ /h	65
High temperature water I/O	°C	76 to 83
Low temperature water I/O	°C	43 to 45
Max. temperature of jacket water	°C	90
I/O pipe of jacket water	DN/PN	DN65/PN16 DN80/PN16
I/O pipe of intercooler water	DN/PN	DN65/PN16
High temperature water pressure	MPa	0.2
Low temperature water pressure	MPa	0.14

7. Engine emission data

ITEM	UNIT	VALUE
NOx (5%O ₂)	mg/Nm ³	≤500
CO (5%O ₂)	mg/Nm ³	≤1006
HC (5%O ₂)	mg/Nm ³	≤132.7
O ₂	%	8
λ	/	1.6

8. Engine emission data

Power	RPM		Connecting rod length	Main journal	Crank pin journal	Allowed crankshaft force
1080kW	1500		350mm	152mm	128mm	55MPa
Bore d	Stroke s	Stroke	Efficiency	Single-cylinder reciprocating mass	Crank-rod ratio	Cylinder arrangement angle
170mm	195mm	4	85.3%	12.61kg	0.2786	90°
Firing order	A1-B2-A5-B4-A3-B1-A6-B5-A2-B3-A4-B6					



Torsional rigidity	C1	C2	C3	C4	C5	C6	C7
MNm/rad	10.4	8.4	8.4	8.4	8.4	8.4	11.49

CHG620V12 Gas Engine

9. Oil Selection Recommendations

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	Mobil	MOBIL PEGASUS 805 SAE40

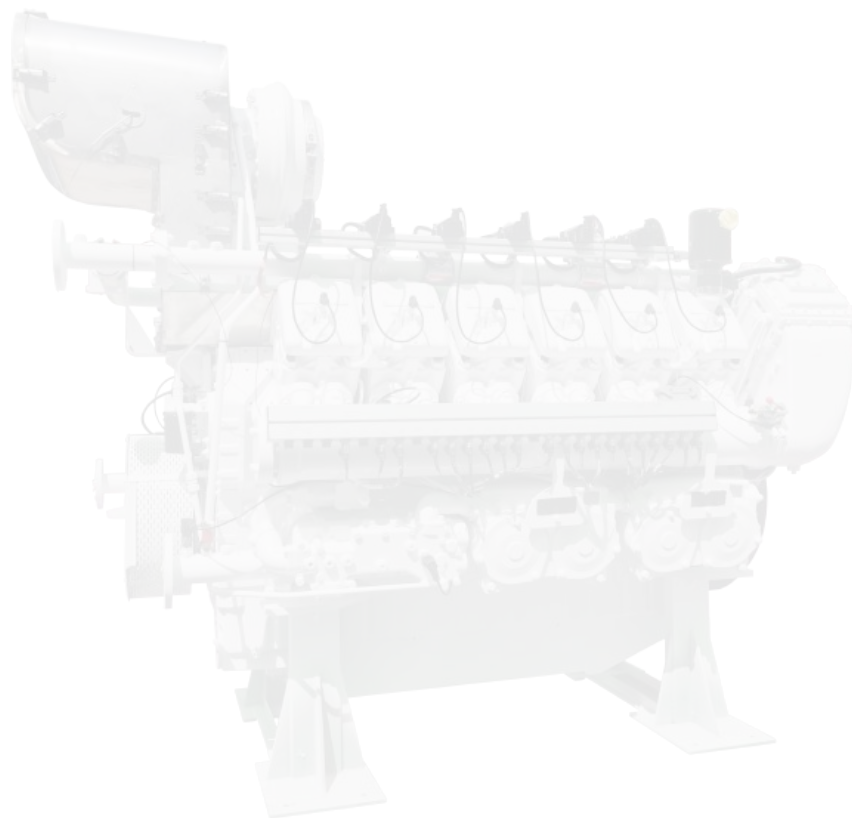
10. Engine coolant

When choosing water as cooling medium, the following requirements should be met:

- A. Use clean water that is slightly alkaline and does not contain corrosive compounds ;
- B. The hardness is 0.7-5.3 mol/L, the content of chloride ion is less than 150mg/ L, and the PH value is 6.0-8.5;
- C. If the water quality does not meet the above requirements, the corresponding softening water equipment or descaling equipment should be added according to the coefficient of 1.2 times of the consumption of cooling water.

Other cooling medium

When the ambient temperature is below 5°C, antifreeze should be selected as the cooling medium. When selecting antifreeze, the freezing point should be 5°C lower than the lowest temperature in the use area.



CHG622V16 Gas Engine

1. Engine technical parameter list

ITEM	UNIT	VALUE
Model		CHG622V16
Rated power	kW	1600
Quantity of Cylinders	PCS	16
Cylinder bore	mm	170
Stroke	mm	215
Displacement	L	78.04
Speed	rpm	1500
Compression ratio		12:1
mean effective pressure	MPa	1.64
mean speed of piston	m/s	10.75
Oil capacity	L	280
Cooling water capacity	L	180
Dimension(L*W*H)	mm	3495×1600×2400
Dry weight	kg	7880
Weight with oil	kg	8300
Moment of inertia of an area(flywheel)	kgm ²	11.35
Direction of rotation		CCW(Look at the flywheel)
Fly wheel		SAE21
EMC		N (By VDE0857)
Starter	kW	2×13 @DC24V

2. Heat balance list of generator set

ITEM	UNIT	VALUE
Electrical power	kW	1500
Gas energy	kW	3651
Electrical efficiency	%	41.08%
Exhaust thermal *	kW	833
Water thermal of cylinder liner	kW	872
Thermal efficiency	/	46.70%
Total efficiency	/	87.78%

*Exhaust gas cooled to 120 °C for natural gas. - Note: All data of gas generator sets are measured under the test environment: Methane volume content ≥95%, Gas temperature 10-40 °C, Gas humidity <60%, Negative pressure of air intake >-3kPa, Exhaust back pressure <5kPa, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity ≤30%, Altitude ≤1000m

CHG622V16 Gas Engine

3. Combustion air and exhaust data sheet for engine

ITEM	UNIT	VALUE
Exhaust temperature	°C	≤580
Max Exhaust temperature	°C	620
Exhaust flow (including H2O)	kg/h	7495
Max Exhaust back pressure	kPa	2.5
Diameter of exhaust pipe		DN400
Combustion air flow	kg/h	7221
Max air pressure before air filter	kPa	2.5

4. Gas consumption data sheet

ITEM	UNIT	VALUE
Gas type		Natural gas
CH4	%	≥80
Methane number (MN)	/	≥80
Gas valve group inlet pressure	kPa	30-50
Engine inlet gas pressure	kPa	6~10
Rate of gas pressure change	kPa/sec	1
Rate of change of heating value of gas	≤	2%/min
Gas intake pipe	mm	100
H2S	≤	20mg/Nm3
All of the sulfur	≤	200mg/Nm3
Solidparticle	≤	5μm and 30mg/m3

5. Technical parameters of engine lubricating oil system

ITEM	UNIT	VALUE
Lubricating oil system volume	L	280
Max oil temperature	°C	95
Oil consumption rate	g/kWh	≤0.25

CHG622V16 Gas Engine

6. Technical parameters of engine cooling system

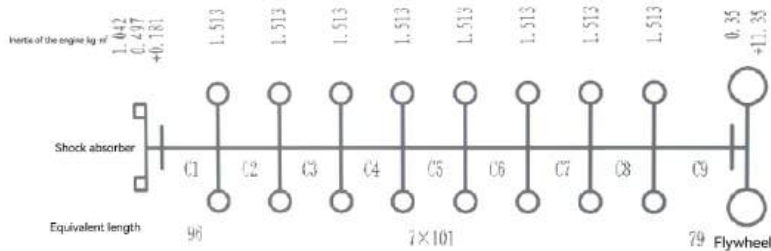
ITEM	UNIT	VALUE
High temperature part heat dissipation	kW	872
Low temperature part heat dissipation	kW	150
Flow of jacket water	m ³ /h	75
Flow of Intercooler water	m ³ /h	65
High temperature water I/O	°C	74 to 84
Low temperature water I/O	°C	43 to 45
Max. temperature of jacket water	°C	90
I/O pipe of jacket water	DN/PN	DN80/PN16
I/O pipe of intercooler water	DN/PN	DN65/PN16
High temperature water pressure	MPa	0.23
Low temperature water pressure	MPa	0.13

7. Engine emission data

ITEM	UNIT	VALUE
NOx (5%O ₂)	mg/Nm ³	≤500
CO (5%O ₂)	mg/Nm ³	≤1006
HC (5%O ₂)	mg/Nm ³	≤132.7
O ₂	%	8
λ		1.6

8. Torsional vibration calculation parameters

Power	RPM		Connecting rod length	Main journal	Crank pin journal	Allowed crankshaft force
1600kW	1500		360mm	170mm	130mm	55MPa
Bore d	Stroke s	Stroke	Efficiency	Single-cylinder reciprocating mass	Crank-rod ratio	Cylinder arrangement angle
170mm	215mm	4	89%	15.24kg	0.2986	90°
Firing order	A1-A7-B4-B6-A4-B8-A2-A8-B3-B5-A3-A5-B2-A6-B1-B7					



Torsional rigidity	C1	C2	C3	C4	C5	C6	C7	C8	C9
MNm/rad	10.4	7.952	7.952	7.952	7.952	7.952	7.952	7.952	11.49

CHG622V16 Gas Engine

9. Oil Selection Recommendations

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	Mobil	MOBIL PEGASUS 805 SAE40

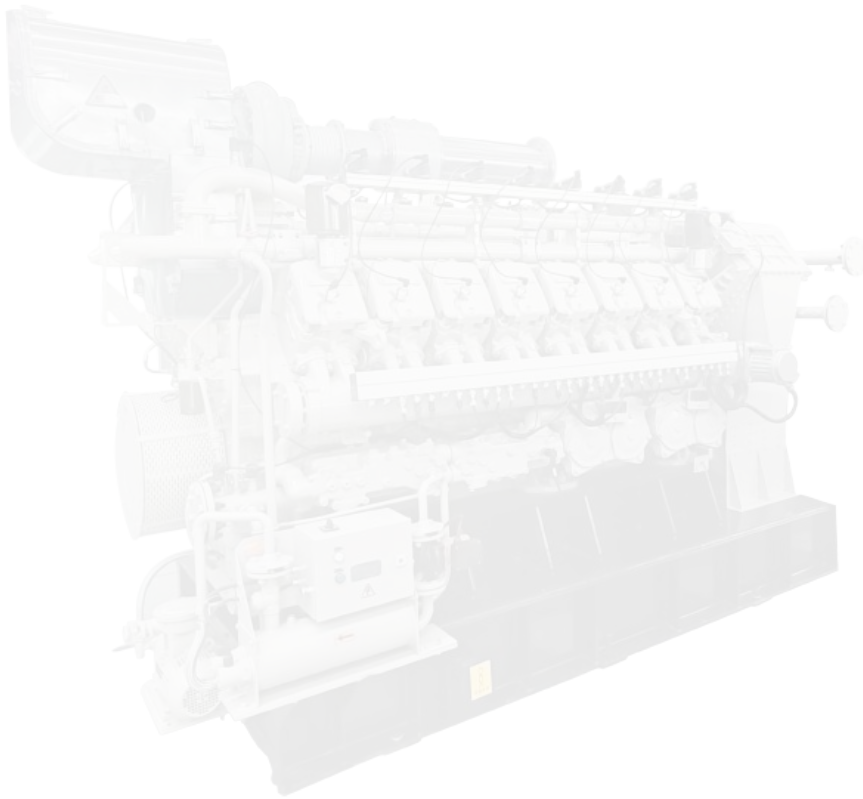
10. Engine coolant

When choosing water as cooling medium, the following requirements should be met:

- A. Use clean water that is slightly alkaline and does not contain corrosive compounds ;
- B. The hardness is 0.7-5.3 mol/L, the content of chloride ion is less than 150mg/ L, and the PH value is 6.0-8.5;
- C. If the water quality does not meet the above requirements, the corresponding softening water equipment or descaling equipment should be added according to the coefficient of 1.2 times of the consumption of cooling water.

Other cooling medium

When the ambient temperature is below 5°C, antifreeze should be selected as the cooling medium. When selecting antifreeze, the freezing point should be 5°C lower than the lowest temperature in the use area.



CHG622V20 Gas Engine

1. Engine technical parameter list

ITEM	UNIT	VALUE
Model		CHG622V20
Rated power	kW	2100
Quantity of Cylinders	PCS	20
Cylinder bore	mm	170
Stroke	mm	215
Displacement	L	97.6
Speed	rpm	1500
Compression ratio		12:1
mean effective pressure	MPa	1.72
mean speed of piston	m/s	10.75
Oil capacity	L	330
Cooling water capacity	L	220
Dimension(L*W*H)	mm	3860×1600×2400
Dry weight	kg	8800
Weight with oil	kg	9300
Moment of inertia of an area(flywheel)	kgm ²	11.35
Direction of rotation		CCW(Look at the flywheel)
Fly wheel		SAE21
EMC		N (By VDE0857)
Starter	kW	2×13 @DC24V

2. Heat balance list of generator set

ITEM	UNIT	VALUE
Electrical power	kW	2000
Gas energy	kW	4843
Electrical efficiency	%	41.3%
Exhaust thermal*	kW	1099
Water thermal of cylinder liner	kW	1116
Thermal efficiency	/	45.75%
Total efficiency	/	87.04%

*Exhaust gas cooled to 120 °C for natural gas. - Note: All data of gas generator sets are measured under the test environment: Methane volume content ≥95%, Gas temperature 10-40 °C, Gas humidity <60%, Negative pressure of air intake >-3kPa, Exhaust back pressure <5kPa, Absolute atmospheric pressure 101.32kPa, Environmental temperature 25°C, Relative humidity ≤30%, Altitude ≤1000m

CHG620V20 Gas Engine

3. Combustion air and exhaust data sheet for engine

ITEM	UNIT	VALUE
Exhaust temperature	°C	≤580
Max Exhaust temperature	°C	620
Exhaust flow (including H ₂ O)	kg/h	9943
Max Exhaust back pressure	kPa	2.5
Diameter of exhaust pipe		DN400
Combustion air flow	kg/h	9578
Max air pressure before air filter	kPa	2.5

4. Gas consumption data sheet

ITEM	UNIT	VALUE
Gas type		Natural gas
CH ₄	%	≥80
Methane number (MN)	/	≥80
Gas valve group inlet pressure	kPa	30-50
Engine inlet gas pressure	kPa	6-10
Rate of gas pressure change	kPa/sec	≤ 1
Rate of change of heating value of gas	%/min	≤ 2
Gas intake pipe	mm	100
H ₂ S	mg/Nm ³	≤ 20
All of the sulfur	mg/Nm ³	≤ 200
Solidparticle	μm/m ³	≤ 5
	mg/m ³	≤ 30

5. Technical parameters of engine lubricating oil system

ITEM	UNIT	VALUE
Lubricating oil system volume	L	330
Max oil temperature	°C	95
Oil consumption rate	g/kWh	≤0.25

CHG622V20 Gas Engine

6. Technical parameters of engine cooling system

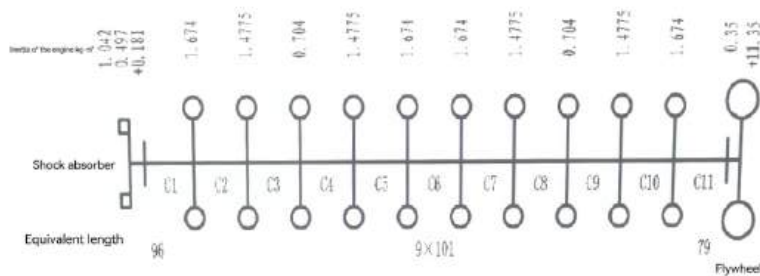
ITEM	UNIT	VALUE
High temperature part heat dissipation	kW	1116
Low temperature part heat dissipation	kW	195
Flow of jacket water	m ³ /h	80
Flow of Intercooler water	m ³ /h	80
High temperature water I/O	°C	72 to 84
Low temperature water I/O	°C	43 to 45
Max. temperature of jacket water	°C	90
I/O pipe of jacket water	DN/PN	DN80/PN16
I/O pipe of intercooler water	DN/PN	DN65/PN16
High temperature water pressure	MPa	0.3
Low temperature water pressure	MPa	0.15

7. Engine emission data

ITEM	UNIT	VALUE
NOx (5%O2)	mg/Nm3	≤500
CO (5%O2)	mg/Nm3	≤1006
HC (5%O2)	mg/Nm3	≤132.7
O2	%	8
λ		1.6

8. Torsional vibration calculation parameters

Power	RPM		Connecting rod length	Main journal	Crank pin journal	Allowed crankshaft force
2105kW	1500		360mm	170mm	130mm	55MPa
Bore d	Stroke s	Stroke	Efficiency	Single-cylinder reciprocating mass	Crank-rod ratio	Cylinder arrangement angle
170mm	215mm	4	89%	15.24kg	0.2986	90°
Firing order	A1-B7-A2-B5-A4-B3-A6-B1-A8-B2-A10-B4-A9-B6-A7-B8-A5-B10-A3-B9					



Torsional rigidity	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
MNm/rad	10.42	8.18	8.18	8.18	8.18	8.18	8.18	8.18	8.18	8.18	12.66

CHG620V20 Gas Engine

9. Oil Selection Recommendations

No	BRAND	MODEL
1	SHELL	SHELL RIMULA R3 NG 15W-40
2	Mobil	MOBIL PEGASUS 805 SAE40

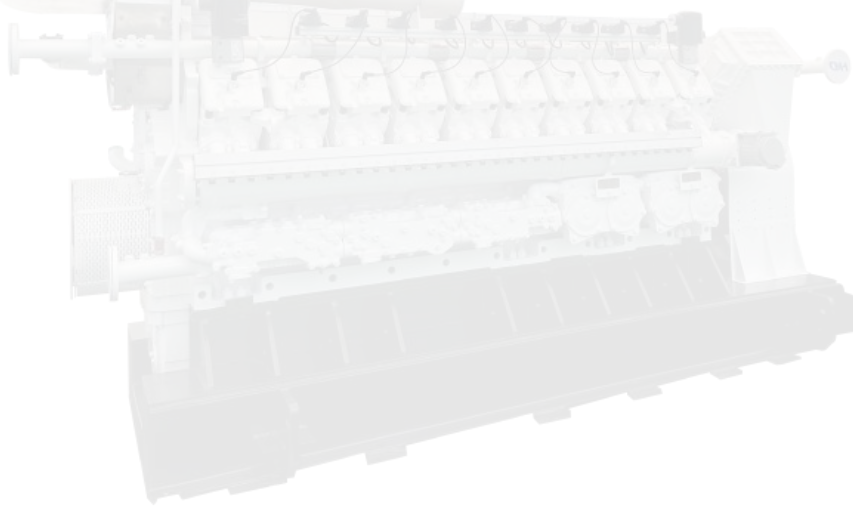
10. Engine coolant

When choosing water as cooling medium, the following requirements should be met:

- A. Use clean water that is slightly alkaline and does not contain corrosive compounds ;
- B. The hardness is 0.7-5.3 mol/L, the content of chloride ion is less than 150mg/ L, and the PH value is 6.0-8.5;
- C. If the water quality does not meet the above requirements, the corresponding softening water equipment or descaling equipment should be added according to the coefficient of 1.2 times of the consumption of cooling water.

Other cooling medium

When the ambient temperature is below 5°C, antifreeze should be selected as the cooling medium. When selecting antifreeze, the freezing point should be 5°C lower than the lowest temperature in the use area.



GAS ENGINE MARKET STATISTICS

Nº	Name	Model	QTY	Installed capacity (kW)	Region	Company	Date of contract
1	CHG620V8 Mashgas Generator Set	500 kW	3	1500 kW	Sichuan	Yingjing Fenghuang Coal Industry Co., Ltd	2010.10
2	CHG620V12 Mashgas Generator Set	800 kW	1	800 kW	Henan	Hebei Coal Industry Co., Ltd. No. 8 Mine	2011.5
3	CHG620L6 Natural Gas Engine	450 kW	1	450 kW	Sichuan	MIRACLE POWER SYSTEMS INC.	2011.6
4	CHG620V8 Mashgas Generator Set	600 kW	6	3600 kW	Hunan	Hunan Lida Energy Source Development Co.,Ltd.	2012.8
5	CHG620V12 Mashgas Generator Set	800 kW	4	3200 kW	Hunan	Hunan Lida Energy Source Development Co.,Ltd.	2012.12
6	CHG620V16 Silent Type Mashgas Generator Set	1000 kW	1	1000 kW	Shanxi	Shanxi Lanneng Coalbed Methane Development Co., Ltd	2013.4
7	CHG620V8、CHG620V16 Mashgas Generator Set	600 kW 1000 kW	3	2200 kW	Sichuan	Qianwei Tangba Coal Industry Co., Ltd.	2015.4
8	CHG620V8、CHG620L6 Natural Gas Generator Set	600 kW 400 kW	2	1000 kW	Shanxi	SiACTPOWER Co., Ltd.	2014.6
9	CHG620V16 Mashgas Generator Set、CHG620V12 Mashgas Generator Set	1000 kW 800 kW	4	3600 kW	Guizhou	Shuikuang Wenjiaba Coal Mine No.1 Mine	2017.3
10	CHG620L6 Natural Gas Generator Set	400 kW	1	400 kW	Henan	Luoyang Xinaohua Oil and Gas Co., Ltd.	2016.9
11	CHG620L6 Natural Gas Engine	400kW	2	800 kW	Henan	Xin Ao(China)Gas Investment Limited	2017.4
12	CHG620L6 Natural Gas Generator Set	400kW	1	400 kW	Shanxi	Baoji Fifth People's hospital	2017.5
13	CHG620V8 low Concentration Mashgas Generator Set	500kW	5	2500 kW	Shanghai	Shanghai Weiting Power System Co., Ltd	2018.2
14	CHG620V12 low Concentration Mashgas Generator Set	800kW	3	2400 kW	Anhui	Yuanyi Coal Mine of Huaibei Mining Co., Ltd. Electric Power Branch	2017.12
15	CHG620V16 Mashgas Generator Set	1000kW	1	1000 kW	Guizhou	Shuikuang Wenjiaba Coal No.1 Mine and Phase II	2018.3
16	CHG620V16 Mashgas Generator Set、CHG620V12 Mashgas Generator Set	1000 kW 800 kW	4	4000 kW	Guizhou	Shuikuang Wenjiaba Coal No.2 Mine	2018.6

PROJECTS

GAS ENGINE MARKET STATISTICS

Nº	Name	Model	QTY	Installed capacity (kW)	Region	Company	Date of contract
17	CHG620V12 low Concentration Mashgas Generator Set	800 kW	4	3200 kW	Anhui	Suzhou Qinan Coal Mine Gas Power Plant	2018.7
18	CHG620V12 Silent Type Low Concentration Mashgas Generator Set	800 kW	1	800 kW	Shanghai	Shanghai Weitingxin Power Generating Machine Co.,Ltd.	2019.1
19	CHG620V16 Silent Type Low Concentration Mashgas Generator Set	1000 kW	10	10000 kW	Guizhou	Yonggui Energy Development Co., Ltd. (Xintian coal mine)	2019.3
20	CHG620V16 Silent Type Low Concentration Mashgas Generator Set	1000 kW	2	2000 kW	Guizhou	Yonggui Energy Development Co., Ltd. (Nuodong coal mine)	2019.5
21	CHG622V20 Silent Type Semi Coke Gas Generator Set	1500 kW	5	7500 kW	Shandong	Shandong Hengli Electric MOTOR Co., Ltd.	2019.5
22	CHG620L6/CHS620L6 Marine Main Engine	420 kW	2	840 kW	Guangdong	Guangzhou Qiaogeli Electromechanical Equipment Co., Ltd.	2019.7
23	CHG620V16 Silent Type Low Concentration Mashgas Generator Set	1000 kW	2	2000 kW	Guizhou	Yonggui Energy Development Co., Ltd. (Second Phase in Xintian)	2019.8
24	CHG620V16 Silent Type Low Concentration Mashgas Generator Set	1000 kW	2	2000 kW	Guizhou	Yonggui Energy Development Co., Ltd. (Xixiu coal mine)	2019.8
25	CHG620V16 Silent Type Low Concentration Mashgas Generator Set	1000 kW	1	1000 kW	Guizhou	Yonggui Energy Development Co., Ltd. (Jiaozishan coal mine)	2019.8
26	CHG620V16 Silent Type Low Concentration Mashgas Generator Set	1000 kW	1	1000 kW	Guizhou	Yonggui Energy Development Co., Ltd. (Qianxi Jinpo Coal Mine)	2019.8
27	CHG620V16 Low Concentration Mashgas Generator Set	1000 kW	1	1000 kW	Shanxi	Shanxi Jiayuan Zhiyuan New Energy Technology Co., Ltd.	2019.1
28	CHG620V12 Silent Type Low Concentration Mashgas Generator Set	800 kW	3	2400 kW	Guizhou	Guizhou Langyue Mining Investment Co., Ltd. (First phase)	2020.4

GAS ENGINE MARKET STATISTICS

Nº	Name	Model	QTY	Installed capacity (kW)	Country	Company	Date of contract
1	CHG622V20 Gas Engine Power Plant	2000 kW	2	4000 kW	Nigeria	VMAN Africa	2020.3
2	DT30 Gas Engine Power Plant	500 kW	10	5000 kW	Russia	VMAN Europe	2023.3
3	CHG620V12 Gas Engine Power Plant	1000 kW	4	4000 kW	Russia	VMAN Europe	2023.5
4	DT30 Gas Engine Power Plant	500 kW	8	3000 kW	Russia	VMAN Europe	2023.6
5	CHG622V20 Gas Engine Power Plant	2000 kW	5	10000 kW	Russia	VMAN Europe	2023.7
6	CET13 Gas Engine Power Plant	250 kW	25	6250 kW	Ukraine	VMAN Europe	2023.8
7	CHG620V16 Gas Engine Power Plant	1500 kW	2	3000 kW	Russia	VMAN Europe	2023.9
8	CET13 Gas Engine Power Plant	250 kW	20	5000 kW	Ukraine	VMAN Europe	2024.4
9	CET13 Gas Engine Power Plant	250 kW	15	3750 kW	Ukraine	VMAN Europe	2024.5
10	CET13 Gas Engine Power Plant	250 kW	8	2000 kW	Russia	VMAN Europe	2024.6
11	DT30 Gas Engine Power Plant	500 kW	7	3500 kW	Russia	VMAN Europe	2024.6
12	CET13 Gas Engine Power Plant	250 kW	80	20000 kW	Ukraine	VMAN Europe	2024.6
13	CHG620V16 Gas Engine Power Plant	1500 kW	7	10500 kW	Russia	VMAN Europe	2024.7



Website



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