



Niroo Pak
Gas Aria

H Series Gas Engines



Solution Partner **Gas Engines Iran**



HM Gas engines

Designed for high performance power generation

- Mechanical power output: from 520 to 1,350 kWb (1,200, 1,500 and 1,800 rpm)
- Powered by natural gas, sewage gas and landfill gas
- Fuel flexibility and fuel blending availability
- High performance
- Low life cycle cost
- Cost efficient
- Compact solution
- Best-in-class electrical efficiencies in biogas and natural gas

HM models :

- G-24HM
- G-42HM
- G-56HM



G-HM Gas engines

The proven HM engine series offers a robust design with This is the first reference of the 42HM model engine recently released.
A cost efficient compact solution for power generation and cogeneration processes.

Applications

- Power generation (50 Hz and 60 Hz)
- CHP - cogeneration

Best-in-class electrical efficiencies in Biogas (W2P) engines, H Series :

24HM: 500 kW_e
42HM: 1,000 kW_e
56HM: 1,300 kW_e

Best-in-class electrical efficiencies in Natural Gas H Series :

24HM: 500 kW_e
56HM: 1,300 kW_e

Power generation - CHP

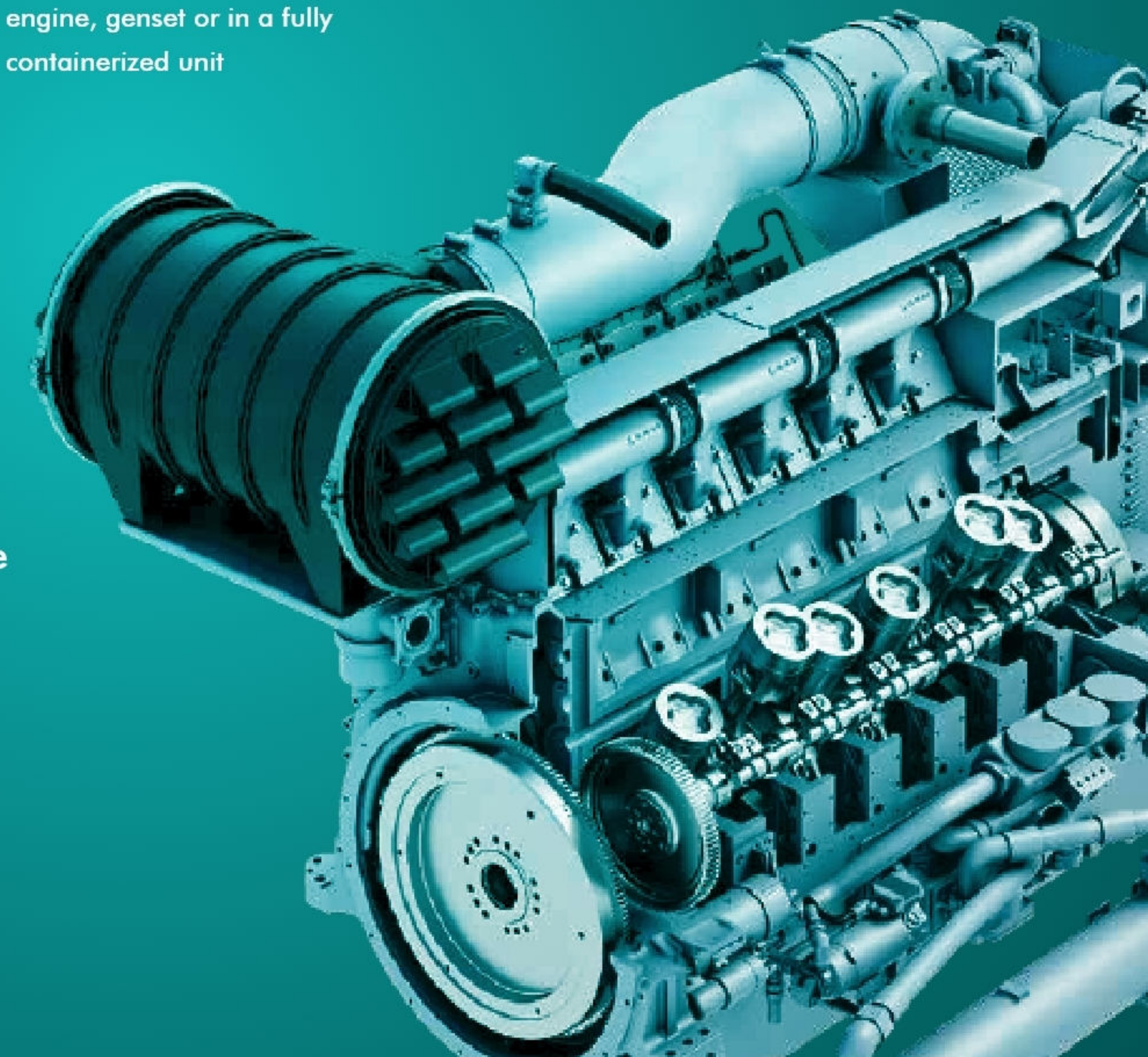
Power output*	502 to 1,315 kW _e
Fuel	Natural gas, biogas
Frequency	50 and 60 Hz
Speed	1,200 /1,500 / 1,800 rpm
Electric efficiency	41 - 43 %
Thermal efficiency	47 - 49 %
Total efficiency	89 - 91 %
NOx emissions	500 mg / Nm ³

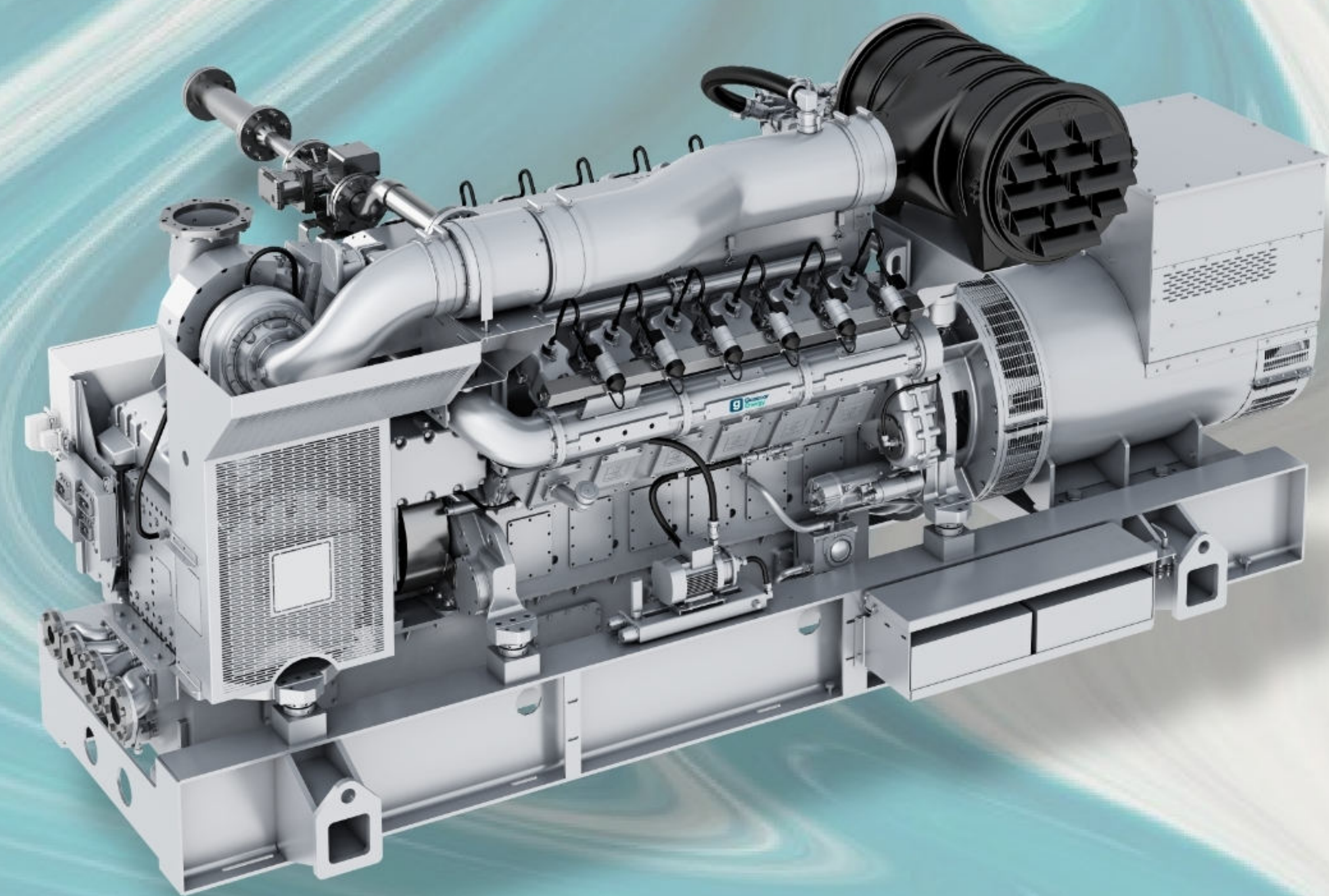
- Miller cycle
- High efficiency
- Turbocharged and aftercooled
- Dry exhaust manifold
- Electronically carburedated
- Fuel blending capability natural gas/biogas available
- Oil cooler in main circuit option available
- Single/double stage intercooler
- Reduced oil consumption
- Emissions control

Physical dimensions

Approximate weight	6,200 to 11,000 kg
Length	4.0 - 5.6 m
Width	1.8 - 1.9 m
Height	1.7 - 2.3 m

- Proven design
 - High thermal efficiency
 - Integrated proprietary GCS-E engine and GCS-G genset control systems
- Supplied as a stand-alone engine, genset or in a fully containerized unit

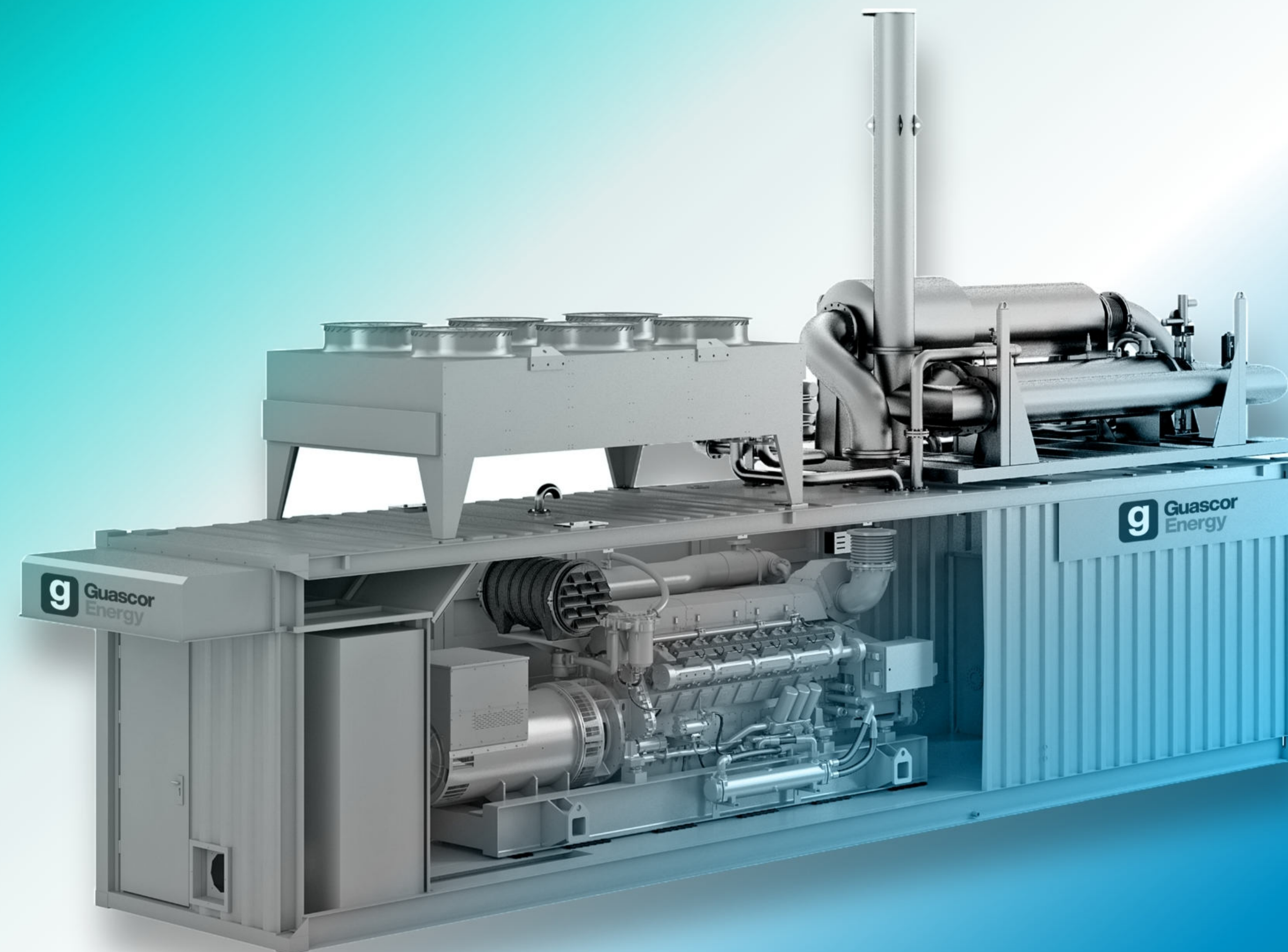




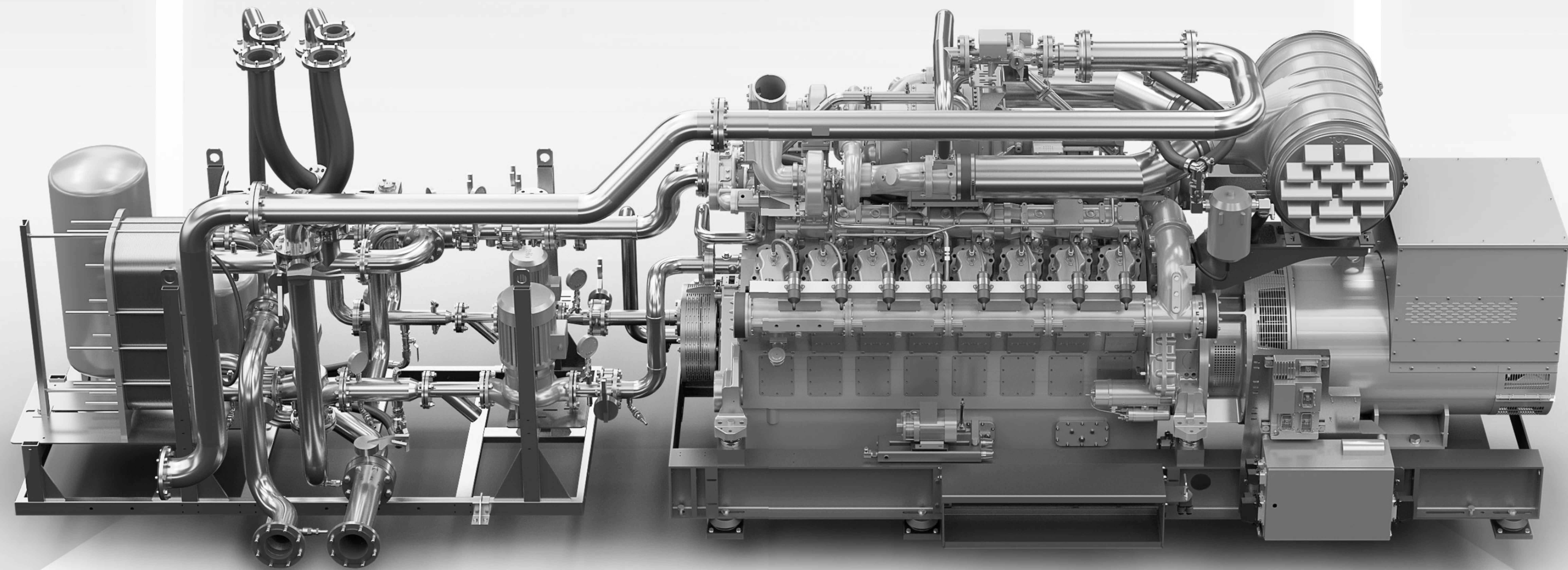
G-42HM



G-24HM

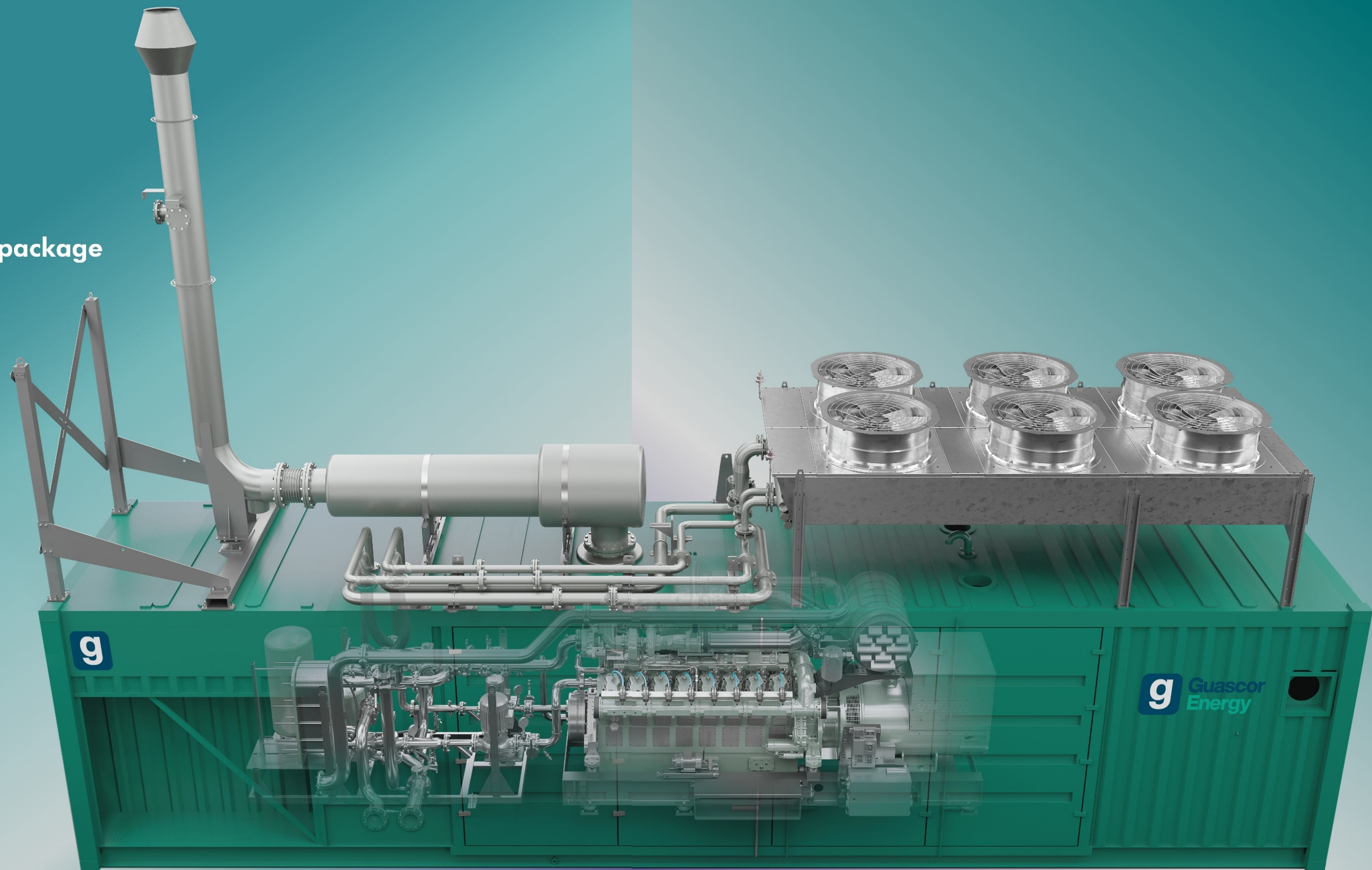


G-56HM
Containerized-package

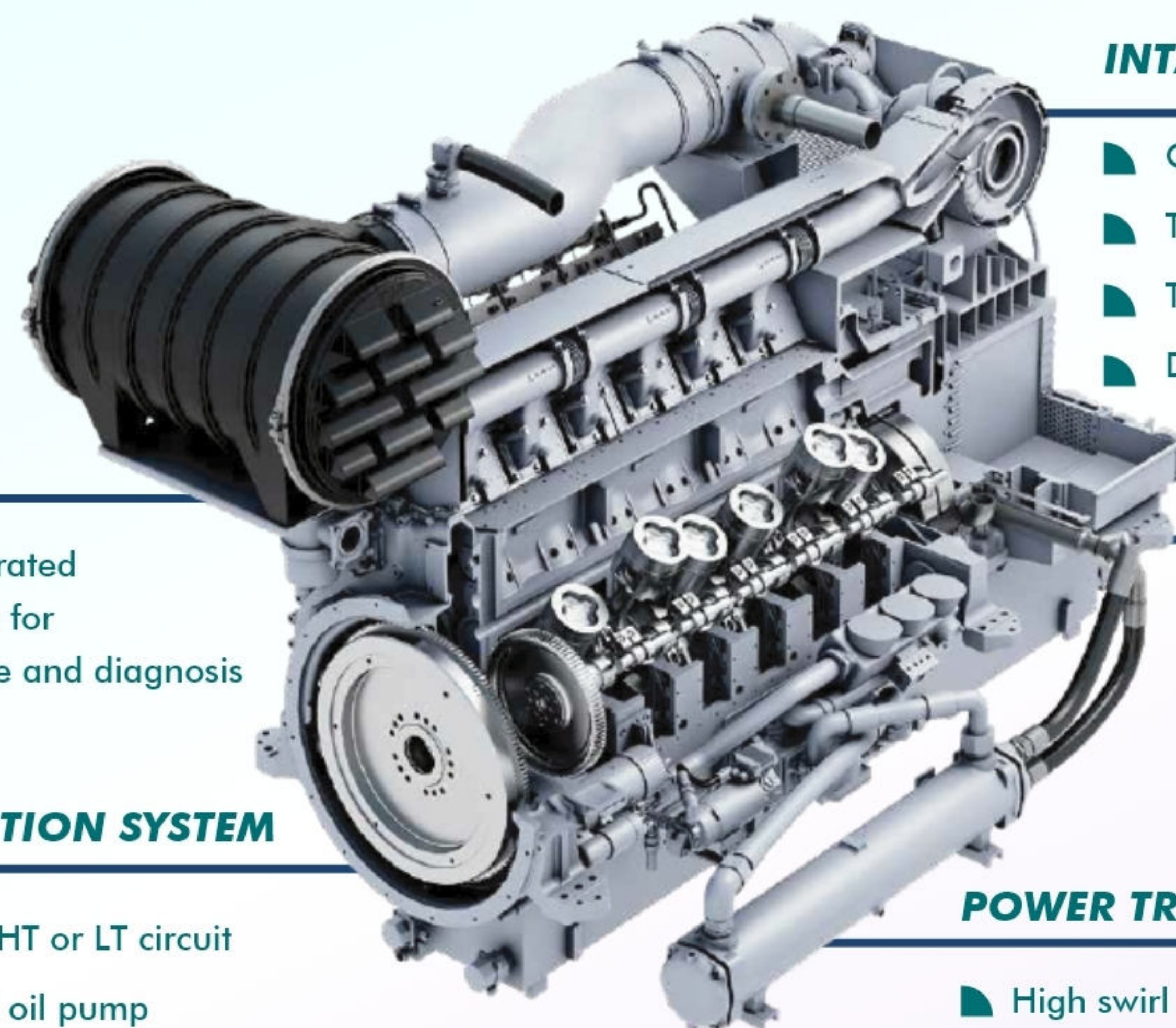


G-56HM

G-56HM
Containerized-package



HM Key features



CONTROL SYSTEM

- Proprietary, fully integrated engine control system for optimized performance and diagnosis

LUBRICATION SYSTEM

- O/C in HT or LT circuit
- Internal oil pump
- Centrifugal oil filter for W2P applications

INTAKE & EXHAUST SYSTEMS

- One high-efficiency turbocharger, water cooled
- Two-stage, on engine integrated, charge cooler
- Two intake manifolds outside the engine
- Dry exhaust manifolds, inside the engine

COMBUSTION SYSTEM

- Two camshafts, Miller cycle
- Cylinder head designed for maximum volumetric efficiency with water cooled
- exhaust valve seats

POWER TRAIN

- High swirl pistons optimized for high efficiency
- Rings designed for optimized oil consumption

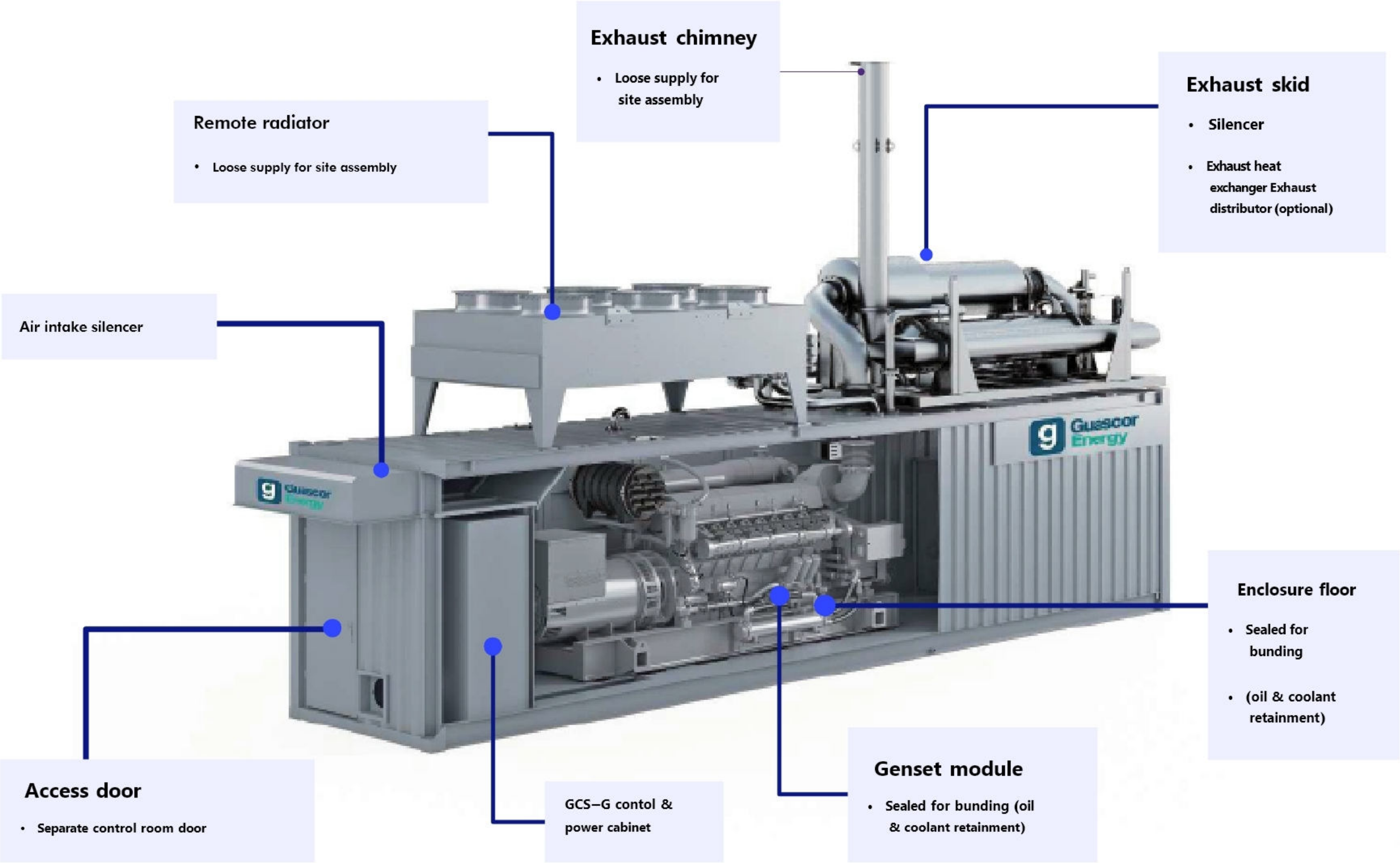


Container models

Container type	40 feet container with embedded aircooler	40 feet container with top mounted aircooler	30 feet container with remote radiator	Soundproof canopy
Brief description	The container is comprised of following individual areas: Engine room is the base module containing the genset, cooling pumps, thermostatic valves and daily oil tank. Cabinet room containing the electrical, control and power panels. Aircooler room containing the cooling system and gas ramp. When necessary also will include the heat recovery skid. Top mounted area- containing the exhaust silencer, chimney and if necessary the exhaust heat recovery. (for local assembly) (*) External use	The container is comprised of following individual areas: Engine room is the base module containing the genset, cooling pumps, thermostatic valves and daily oil tank. Also a heat water recovery skid can be included if necessary. Cabinet room containing the electrical, control and power panels. Top mounted area containing the exhaust silencer, chimney and the genset cooling system. If necessary also will include the exhaust heat recovery skid. (for local assembly) (*) External use	The container is comprised of following individual areas: Engine room is the base module containing the genset, cooling pumps, thermostatic valves and daily oil tank. Cabinet room containing control and power panels. The gas ramp will be installed on foot of it in one side. The cooling system, aircooler and exhaust silencer will be installed outside the container. Indoor use.	The container is comprised of a common bedframe that includes: The genset, pumps, thermostatic valves, plate heat exchanger, expansion vessels, exhaust recovery system, oil tank and control and power panels. The exhaust silencer will be installed on the roof and the aircooler outside in a remote area. (*) External use
Sound pressure level	Down to 75 dB (A) in 10 m except for the 56SL T30 model with 75 dB (A) in 1 m	Down to 75 dB (A) in 10m except for the 56SL T30model with 75 dB (A) in 1 m	Down to 75 dB (A) in 1 m	Down to 75 dB (A) in 1 m
Ambient temperatures (*)	The container is designed for ambient temperatures of -18°C to 35°C with an option to reach up to 45°C	The container is designed for ambient temperatures of -18°C to 45°C	The container is designed for ambient temperatures of -10°C to 29.5°C	The container is designed for ambient temperatures of 0°C to 35°C
Dimensions	Length:12,192 mm; Width: 2,438 mm; Height: 2,896 mm	Length:12,192 mm; Width: 2,438 mm; Height: 2,896 mm	Length:9,144 mm; Width: 2,438 mm; Height: 2,896 mm	Length:6,000 mm; Width: 2,000 mm; Height: 3,100 mm
Applications by engine models	Power generation: S Series including 56SLT30. H Series Line engine. Cogeneration: All engines except for V engines of the H Series and 56 lite engines (SL, SM)	Power generation: H Series except for 24 HM, SM gas propane. Cogeneration: H Series except for 24HM, SM gas propane and 56 liter engines	Fast start: 56SL T30 engine	Power Generation, Cogeneration for all L engines

Container models

Key features



Performance data overview

Engine Model	Speed (rpm)	Fuel type	Electrical Power (kW)	Electrical Eff. (%)	Thermal Power (kW)	Thermal Eff. (%)	Global Eff. (%)	Engine Dimensions [L x W x H] (m)	Engine Dry Weight (kg)	Genset Dimensions [L x W x H] (m)	Genset Dry Weight [kg]
G-18SL	1,200	Natural gas	241	38.6	320	51.3	89.9	2.0 x 0.95 x 1.46	2,700	3.02 x 1.2 x 1.85	4,000
G-24SL		Natural gas	322	36.1	485	54.6	90.7	2.61 x 0.95 x 1.46	3,500	3.66 x 1.27 x 1.91	4,940
G-36SL		Natural gas	484	38.6	656	52.2	90.8	2.64 x 1.37 x 1.74	4,200	3.83 x 1.66 x 2.13	7,230
G-48SL		Natural gas	648	37.7	980	55.1	92.8	3.14 x 1.37 x 1.74	5,450	4.4 x 1.66 x 2.18	9,225
G-56SL		Natural gas	762	39.0	1,013	51.8	90.8	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000
G-18SL	1,500	Natural gas	303	39.1	396	51.0	90.1	2.0 x 0.95 x 1.46	2,700	3.02 x 1.2 x 1.85	4,000
G-24SL		Natural gas	404	38.5	546	51.9	90.4	2.61 x 0.95 x 1.46	3,500	3.66 x 1.27 x 1.91	4,940
G-36SL		Natural gas	610	38.9	810	51.7	90.6	2.64 x 1.37 x 1.74	4,200	3.83 x 1.66 x 2.13	7,230
G-48SL		Natural gas	811	38.8	1,093	52.2	91.0	3.14 x 1.37 x 1.74	5,450	4.4 x 1.66 x 2.18	9,225
G-56SL		Natural gas	954	39.0	1,280	52.2	91.2	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000
G-56SL T30	1,800	Natural gas	1,058	39.8	1,379	51.8	91.6	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000
G-18SL		Natural gas	336	37.4	477	53.0	90.4	2.0 x 0.95 x 1.46	2,700	3.02 x 1.2 x 1.85	4,000
G-24SL		Natural gas	436	38.5	666	55.1	93.6	2.61 x 0.95 x 1.46	3,500	3.66 x 1.27 x 1.91	4,940
G-36SL		Natural gas	676	37.7	953	53.1	90.8	2.64 x 1.37 x 1.74	4,200	3.83 x 1.66 x 2.13	7,230
G-48SL		Natural gas	874	36.1	1,340	55.4	91.5	3.14 x 1.37 x 1.74	5,450	4.4 x 1.66 x 2.18	9,225
G-56SL		Natural gas	1,030	39.0	1,534	54.5	93.5	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000

Performance data overview

Engine Model	Speed (rpm)	Fuel type	Electrical Power (kW)	Electrical Eff. (%)	Thermal Power (kW)	Thermal Eff. (%)	Global Eff. (%)	Engine Dimensions [L x W x H] (m)	Engine Dry Weight (kg)	Genset Dimensions [L x W x H] (m)	Genset Dry Weight [kg]
G-18SL	1,200	Biogas	241	38.4	322	51.4	89.8	2.0 x 0.95 x 1.46	2,700	3.02 x 1.2 x 1.85	4,000
G-24SL		Biogas	322	36.0	486	54.5	90.5	2.61 x 0.95 x 1.46	3,500	3.66 x 1.27 x 1.91	4,940
G-36SL		Biogas	484	38.3	663	52.4	90.7	2.64 x 1.37 x 1.74	4,200	3.83 x 1.66 x 2.13	7,230
G-48SL		Biogas	648	36.3	982	55.0	91.3	3.14 x 1.37 x 1.74	5,450	4.4 x 1.66 x 2.18	9,225
G-56SL		Biogas	762	38.6	1,026	52.0	90.6	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000
G-18SL	1,500	Biogas	303	39.0	398	51.0	90.0	2.0 x 0.95 x 1.46	2,700	3.02 x 1.2 x 1.85	4,000
G-24SL		Biogas	404	38.4	546	51.8	90.2	2.61 x 0.95 x 1.46	3,500	3.66 x 1.27 x 1.91	4,940
G-36SL		Biogas	610	38.9	810	51.6	90.5	2.64 x 1.37 x 1.74	4,200	3.83 x 1.66 x 2.13	7,230
G-48SL		Biogas	811	38.7	1,097	52.2	90.9	3.14 x 1.37 x 1.74	5,450	4.4 x 1.66 x 2.18	9,225
G-56SL		Biogas	954	38.9	1,287	52.2	91.1	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000
G-18SL	1,800	Biogas	336	37.2	480	53.1	90.3	2.0 x 0.95 x 1.46	2,700	3.02 x 1.2 x 1.85	4,000
G-24SL		Biogas	436	35.9	663	54.7	90.6	2.61 x 0.95 x 1.46	3,500	3.66 x 1.27 x 1.91	4,940
G-36SL		Biogas	676	37.6	955	53.1	90.7	2.64 x 1.37 x 1.74	4,200	3.83 x 1.66 x 2.13	7,230
G-48SL		Biogas	874	36.0	1,345	55.4	91.4	3.14 x 1.37 x 1.74	5,450	4.4 x 1.66 x 2.18	9,225
G-56SL		Biogas	1,030	36.4	1,540	54.6	91.0	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000

Performance data overview

Engine Model	Speed (rpm)	Fuel type	Electrical Power (kW)	Electrical Eff. (%)	Thermal Power (kW)	Thermal Eff. (%)	Global Eff. (%)	Engine Dimensions [L x W x H] (m)	Engine Dry Weight (kg)	Genset Dimensions [L x W x H] (m)	Genset Dry Weight [kg]
G-56SM	1,500	Natural gas	1,025	39.7	1,319	51.0	90.7	3.0 x 1.55 x 2.2	5,800	4.67 x 1.66 x 2.18	10,000
	1,800	Natural gas	1,063	37.9	1,486	52.9	90.8				
	1,500	Biogas	1,025	39.4	1,330	51.1	90.5				
	1,800	Biogas	1,063	37.8	1,494	52.9	90.7				
G-18SR	1,800	Natural gas	268	32.4	498	60.1	92.5	2.55 x 1.19 x 2.30	2,750	2.67 x 1.36 x 2.43	4,100
G-24SR		Natural gas	361	31.6	698	61.2	92.8	2.99 x 1.23 x 2.58	3,500	3.00 x 1.38 x 2.79	5,200
G-36SR		Natural gas	539	32.5	1,000	60.3	92.8	2.91 x 1.61 x 3.35	4,500	3.18 x 1.75 x 3.50	7,750
G-48SR		Natural gas	724	31.8	1,403	61.5	93.3	3.42 x 1.61 x 3.75	5,400	4.26 x 1.75 x 3.91	9,250
G-56SR	1,200	Natural gas	839	33.2	1,518	60.1	93.3	3.42 x 1.52 x 4.03	5,600	4.26 x 1.75 x 3.91	9,300
G-56HM		Natural gas	1,011	42.5	1,120	47.1	89.6	4.04 x 2.14 x 2.22	7,500	5.54 x 2.14 x 2.32	12,200
G-24HM		Natural gas	501	42.7	564	48.0	90.7	3.22 x 2.08 x 1.59	4,200	3.95 x 2.08 x 1.74	6,230
G-42HM		Natural gas	1,011	43.0	1,090	46.4	89.4	3.57 x 2.15 x 2.37	6,250	4.86 x 2.15 x 2.37	10,735
G-56HM	1,500	Natural gas	1,315	43.4	1,400	46.2	89.6	4.04 x 2.14 x 2.22	7,500	5.54 x 2.14 x 2.32	12,200
G-24HM		Natural gas	499	40.5	599	48.5	89.0	3.22 x 2.08 x 1.59	4,200	3.95 x 2.08 x 1.74	6,230
G-42HM		Natural gas	1,007	41.1	1,184	48.4	89.5	3.57 x 2.15 x 2.37	6,250	4.86 x 2.15 x 2.37	10,735
G-56HM		Natural gas	1,305	41.3	1,534	48.4	89.7	4.04 x 2.14 x 2.22	7,500	5.54 x 2.14 x 2.32	12,200

Engine Model	Speed (rpm)	Fuel type	Electrical Power (kW)	Electrical Eff. (%)	Thermal Power (kW)	Thermal Eff. (%)	Global Eff. (%)	Engine Dimensions [L x W x H] (m)	Engine Dry Weight (kg)	Genset Dimensions [L x W x H] (m)	Genset Dry Weight [kg]
G - 56HM	1,200	Biogas	1,011	42.2	1132	47,3	89.5	4.04 x 2.14 x 2.22	7,500	5.54 x 2.14 x 2.32	12,200
G-24HM	1500	Biogas	501	42.5	567	48.1	90.6	3.22 x 2.08 x 1.59	4,200	3.95 x 2.08 x 174	6,230
G-42HM		Biogas	1,011	42.8	1,101	46.6	89.4	3.57 x 2.15 x 2.37	6,250	4.86 x 2.15 x 2.37	10,735
G-56HM		Biogas	1,315	43.1	1,412	46.3	89.4	4.04 x 2.14 x 2.22	7,500	5.54 x 2.14 x 2.32	12,200
G-24HM		Biogas	499	40.2	604	48.6	88.8	3.22 x 2.08 x 1.59	4,200	3.95 x 2.08 x 1.74	6,230
G-42HM	1,800	Biogas	1,007	41.0	1,190	48.5	89.5	3.57 x 2.15 x 2.37	6,250	4.86 x 2.15 x 2.37	10,735
G-56HM		Biogas	1,305	41.1	1,547	48.6	89.7	4.04 x 2.14 x 2.22	7,500	5.54 x 2.14 x 2.32	12,200
G-86EM	1,500	Natural gas	2,013	45.7	2,085	46,9	92.6	6.56 x 2.43 x 2.75	15,500	6.56 x 2.43 x 2.75	25,000
G-100EM	1,200	Natural gas	2,007	45.4	2,057	46.6	92	6.56 x 2.43 x 2.75	15,500	6.56 x 2.43 x 2.75	25,000

Notes

- (1) For S Series: Natural Gas MN>75 and Biogas: 62,5% CH4, 36% CO2 and 1,5% N2. For other type of gases, please contact Engines.
- (2) For H and E Series: Natural Gas MN>80 and Biogas 67% CH4 and 33% CO2 (only for H Series).
- (3) Thermal efficiency of the S Series engines calculated considering the exhaust gases heat recovery until 120°C.
- (4) Thermal efficiency of the E Series engines calculated considering the exhaust gases heat recovery until 80°C.
- (5) Emissions level for SR Series: 0,1 g/bHPh.
- (6) SR dimensions including catalyzer.

Remarks

- Engine performance data acc. to ISO 3046/1, 25°C and 500 meters above sea level, with a tolerance of +5%.
- Emissions level: NOx < 500 mg/Nm3 (50 Hz) and 1 g/bHPh (60Hz).
- Lower emission engines are available. Please, contact for performance data.
- Electrical power at power factor = 1.400 V (50Hz) and 480 V(60 Hz).
- The dimensions and weights are approximate values and are subject to changes without prior notice.
- The values given in this data sheet are for information purposes only and not binding.