



Mobilnost Plus™ PLC

GAS POWER

1D12VG-300

Industrial engine

Technical data

Basic technical data

Number of cylinders: 12

Cylinder arrangement: 57-Degree Vee.

Cycle: 4 stroke, spark ignition.

Induction system: Naturally aspirated.

Bore 150 mm.

Stroke: 180 mm.

Compression ratio: 12.0:1÷9:1

Cubic capacity: 38,8 liters.

Direction of rotation: Anti-clockwise viewed on flywheel.

Firing order: 1L-6R-5L-2R-3L-4R-6L-1R-2L-5R-4L-3R

Engine weight (dry): 1250 kg

Engine weight (wet): 1430 kg

Overall Dimensions:

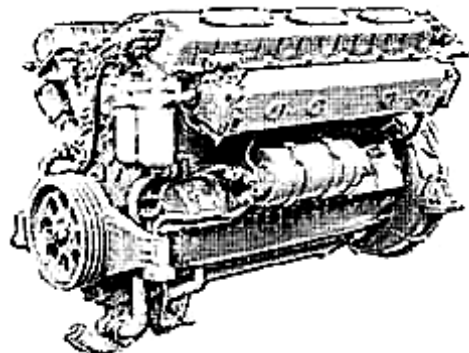
Engine only: Height 1160 mm Length 1590 mm Width 1052 mm.

Performance

Note: All data based on operation under ISO 3046/1 and Fuel: Natural gas - LHV 34,71 MJ/m³

Test conditions: Air temperature 20°C, barometric pressure 101 kPa, relative humidity 70%, air inlet restriction at maximum power 5,88 kPa (600 mm H₂O), exhaust back pressure 9,3 kPa (70 mm Hg).

De-rating data: 5.8% per 500 m, and 1.4% per 5°C above standard reference conditions.



General Installation data

Item	Units	Type of operation	
		Continuous	Standby
		50 Hz	50 Hz
Engine speed	rev/min	1500	1500
Gross engine power	kW	220	243
2 hour max power	kW	-	243
BMEP gross	bar	4,64	6,2
Piston speed	m/s	9,6	9,6
Net engine power with fan	kW	200	225
Engine coolant flow	ltr/min	475	475
Combustion air flow	m ³ min	11,3	12,5
Exhaust gas flow	m ³ min	49,5	54,5
Exhaust gas temperature	°C	520	580
Nominal excess air factor (Lambda)	λ	1.45	1.1
Overall efficiency	%	34.3	35.4

Fuelsystem

Recommended fuel: Natural Gas LHV at 34MJ/m
Other fuels may be used: e.g. LPG, Landfill, Sludge-gas, Wellhead gas. Ratings will vary from those shown. Where fuels other than Natural Gas are being considered it is imperative that a full gas analysis (including details of any solid or liquid components) be obtained. Reference should then be made to Mobilnost Plus to determine its suitability.

Gas supplies must be filtered to the same standard as the engine intake air, i.e. Maximum particle size not to exceed 5 micron Gas fuel shouldn't contain more than 0,1% sulfur hydrates.

Gas supply pressure: 0,48 kPa (50 mm H₂O) - after regulator at full rated flow conditions.

Carburetor type: Energogastechnology™ LTD. complete with pressure regulator.

Fuel Consumption Calculated on Engine Gross Power:

Engine speed 1500 RPM @100% of load,

Water cooled exhaust manifold, 10,2 MJ/

kWhr 2,043 MJ/hr

Fuel: Natural gas - LHV = 34,71 MJ/m³.

Note: In any installation the pressure regulator must always be mounted with the spring housing downwards, to ensure normal operation.

Lubrication system

Recommended lubricating oil: Chevron Special Motor oil, Essolube HD, Gulflube Motor oil HD, Gulico 440, Mobil Delvas 940, Fina Solna HD S-1 (Petrofina), Shell Rotella SX oil 40, Texaco (Ursa) Garant HD, Total HD 1-A, HDO, Valvodiesel HD S-1, Motor oil (Valvoline), BP Energol-1CD (HD), Castrol CRI Deusol CRI, Agip. F. 1. Diesel Alfa

Lubricating oil capacity:

Engine: 28 litres

Total system: 75 litres.

Sump maximum: 75 litres.

Sump minimum: 35 litres.

Pressure at which oil relief valve opens: 950 kPa

Lubricating oil pressure: At rated speed: 500-1050 kPa.

Minimum at rated speed: 345 kPa.

Lubricating oil temperature:

Normal: 95°C - 105°C. **Maximum:** 115°C.

Lubricating oil consumption: 0,2 - 0,6 ltrs/hr.

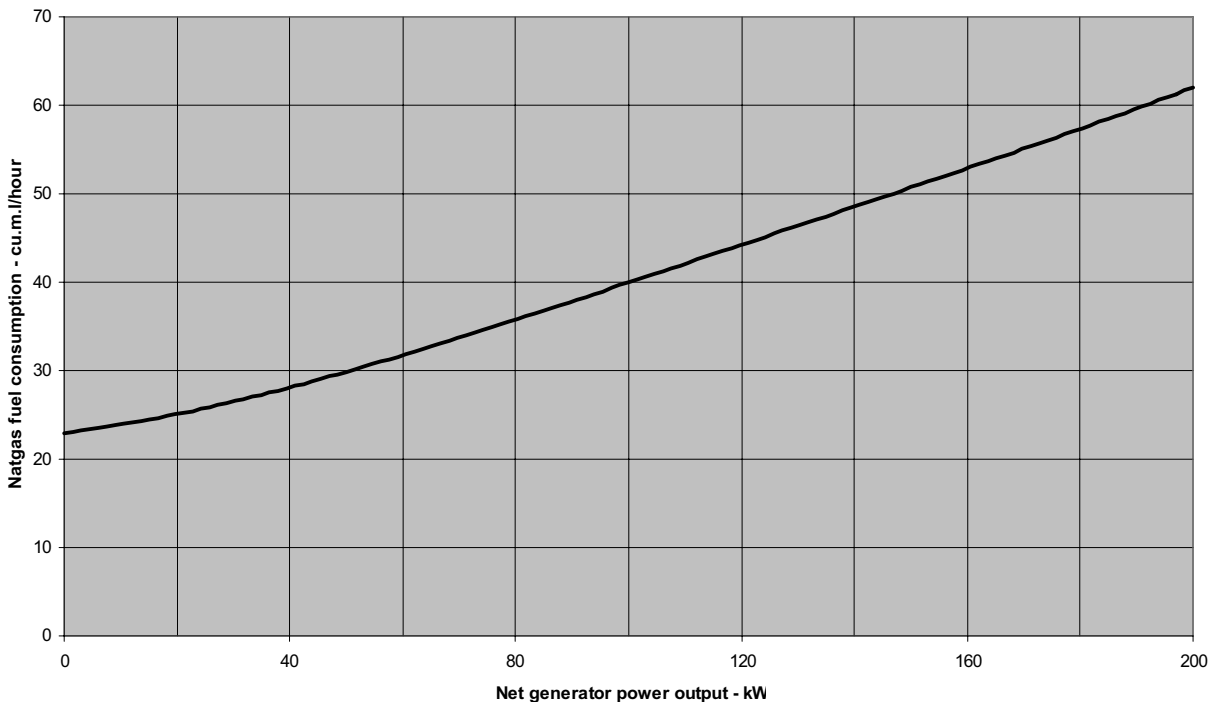
Oil pump speed and method of drive:

1.5 x erpm, gear.

Oil pump flow: 1500 rev/min: 18 litres/sec.

Shutdown switch setting: 250 kPa. Customized

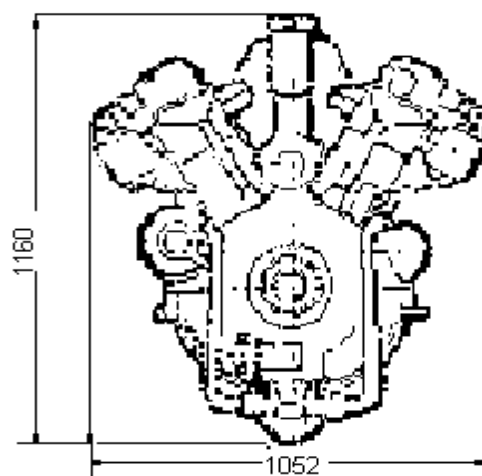
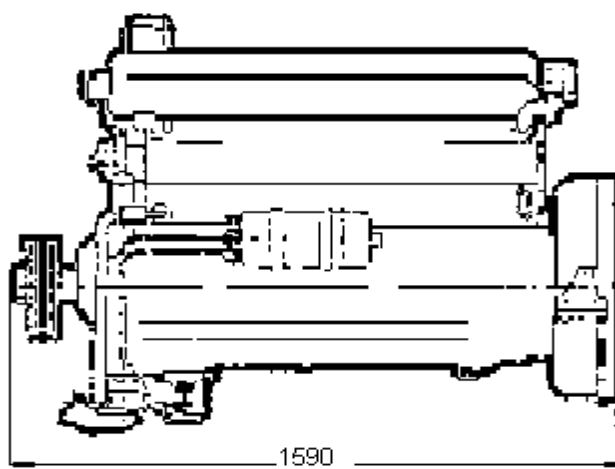
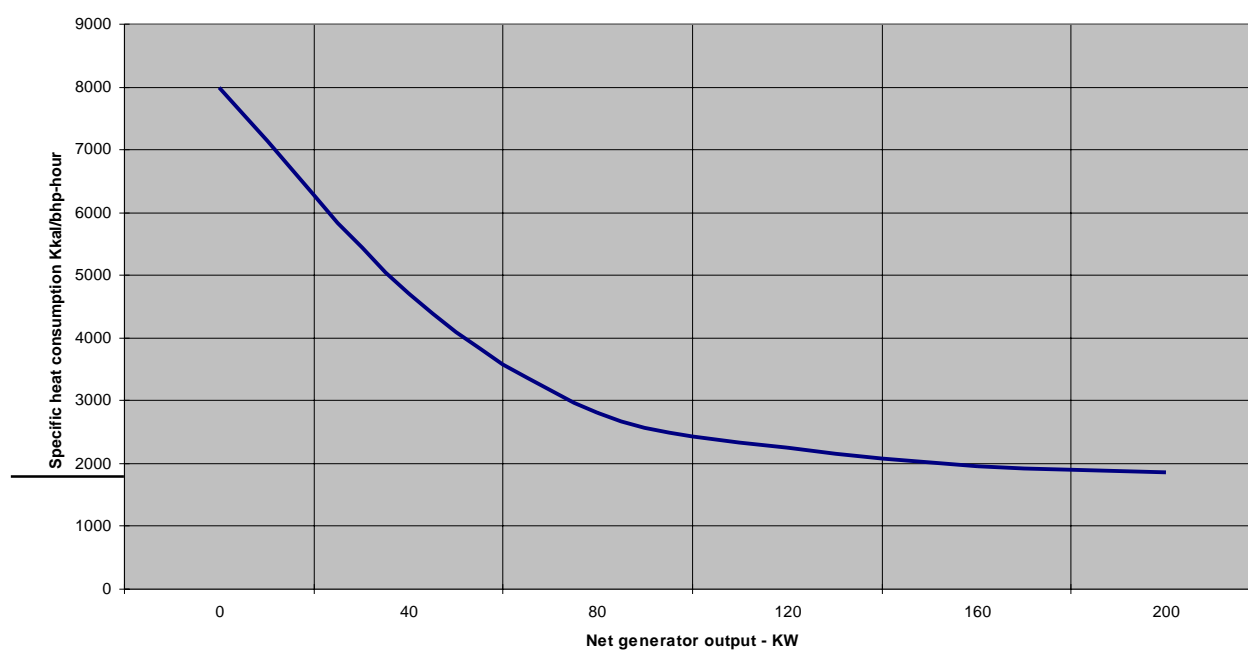
Natural gas fuel consumption for 1D12G engine gensets at 1500 RPM



Heat balance

	Units	Continuous	Standby
Engine speed	rev/min	1500	1500
Total heat from fuel	kW	570	680
Heat to power (gross)	kW	200	243
Heat to exhaust (cooled to 120°C.)	kW	133	156
Heat to water and oil	kW	176	203
Heat to radiation	kW	48	52

Specific heat consumption for 1D12G engine genset @ 1500 RPM



Cooling system

Recommended coolant: 50% inhibited ethylene glycol or 50% inhibited propylene glycol and 50% clean fresh water. For combined heat and power systems and where there is no likelihood of ambient temperature below 10°C, then clean "soft" water may be used, treated with 1% by volume of PE(S)L inhibitor, in the cooling system.

Coolant pump speed and method of drive: 1.50 x erpm, gear.

Maximum static pressure head on pump: 149 kPa (15240 mm H₂O).

Maximum engine water outlet temperature: 115°C.

Minimum temperature entering engine: 70°C

Temperature rise across engine 1500 rev/min @100% load: 9.0°C.

Maximum permissible external cooling system resistance: 20 kPa. (with gear driven coolant pump).

Protection switch setting: 100°C customized

Shutdown switch setting: 106°C customized

Coolant immersion heater capacity: 1x3,0 kW.

Total engine coolant capacity: 50,0 litres

Cooling system should incorporate a header tank whose minimum capacity should exceed 14% of total system, 5% of which should be air space for expansion.

Heat exchangers: model 1275-00-10-1 (water), 1275-00-20-1(oil)

Cooling surface: 2,3m².

Coolant restriction 16 kPa

Cooler restriction 20 kPa

Dimensions and material: Ø310 mm. Length 310 mm, Copper.

Maximum top tank temperature: 110°C.

Induction system

Maximum air intake restriction of engine:

Clean filter: 255 mm H₂O. **Dirty filter:** 635 mm H₂O.

Air filter: Dry type

Ignition system

Ignition system type: Enrgogastechnology LTD.

Supply voltage: 24 volts.

Polarity: Negative earth.

Ignition coils: Digital capacitive system.

Timing sensor: Camshaft timing (active): 1,2mm pick-up. Flywheel teeth (passive): 1,2mm pick-up.

Spark plug type: SD-38BSM or SD-48I1M 18x1 mm

Spark plug gap: 0.8 mm.

Spark plug leads: Copper core, silicon leads, 5 kOhm resistor.

Ignition timing: 28÷32 deg. BTDC.

Exhaust system

Maximum back pressure for total system: 10,1 kPa (1000 mm H₂O).

Inside dimension of exhaust outlets: 2 x 100 x100 mm.

Governing

Standard: Mechanical

Option: Electronic governor: Heinzmann E2040-SC governing system or Barber-Colman DYN1 10504-001-0-24.

Electrical system

Type: Insulated return.

Alternator: G74-B (regulator RRT32M).

Alternator output: 78 amps at stabilized output 28 volts at 20°C ambient.

Starter motor: ST722 24 volt.

Starter motor power: 9,0 kW.

Number of teeth on flywheel: 128. **Number of teeth on starter motor:** 12

Minimum cranking speed: 100 rev/min.

Pull in current of starter motor solenoid: 26,8 amps at 24 volts.

Hold in current of starter motor solenoid: 9 amps at 24 volts.

Average continuous current requirement of installed engine including: Ignition system, electronic governor, and typical starting requirements = 7,5 Amps.

Engine mounting

Maximum bending moment at the rear face of the engine crankcase: 1200 Nm.

Position of centre of gravity (bare dry engine) forward from rear face of crankcase: 755 mm.

Above crankshaft centre line on vertical centre line: 450mm

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