

Perkins based INDUSTRIAL GAS ENGINES

Technical Data

CHP NG KVT-E70SI

Gas Engine

Basic technical data

Number of cylinders 6
 Cylinder arrangement Vertical, In line
 Cycle 4 stroke, spark ignition
 Induction system Naturally aspirated
 Compression ratio 13.0:1
 Nominal bore 105 mm
 Stroke 135 mm
 Cubic capacity 7,0 litres
 Direction of rotation Anti-clockwise viewed on flywheel
 Firing order 1, 5, 3, 6, 2, 4
 Cylinder 1 Furthest from flywheel
 Total weight of electro unit (engine only)
 - estimated total weight (dry) 788 kg
 - estimated total weight (wet) 822 kg

Overall dimensions

- height 1142 mm
 - length 1763 mm
 - width 756 mm

Moment of inertia (GD²)

- Flywheel 0.27 kgm²

Ratings

This is defined in ISO3046 / 1 (BS5514 / 1 - 2002)
 The tolerance for the specific fuel consumption is +5% at rated output. The tolerance for the usable heat is 7% at rated output. Ratings are based on maximum engine load.

Operating point

Engine speed 1500 rev/min
 Ignition timing 20° BTDC

Fuel data

Lower calorific value >30,000 kJ/Sm³
 Methane number > 80
 Density 0,833 kg/Sm³

Test conditions

-air temperature 25 °C (77 °F)
 -barometric pressure 100 kPa (29.5 in hg)
 -relative humidity 30%
 -natural gas LCV 31,65 MJ/Nm³

Emissions at 100% load (Correlation 5 % O₂)

-NO_x mg/Nm³ < 8000
 -CO mg/Nm³ < 6500
 -Engine surface noise dB (A) 98
 -Exhaust sound power level dB (A) 120

Energy balance $\lambda = 1$

KVT-E70SI - Cogeneration unit

Rating @ 1500 rev/min	Units	Metric		
		100%	75%	50%
Ignition timing	°BTDC	20	20	20
Energy in fuel	kW	190,0	153,0	126,7
Energy in power output (Net)	kW	67,0	50,3	33,5
Energy in exhaust back to 25°C	kW	44,3	33,1	28,9
Energy to coolant	kW	45,0	42,0	41,0
Energy to radiation	kW	33,7	27,7	23,2

Efficiency

KVT-E70SI - Cogeneration unit

Rating @ 1500 rev/min	Units	Metric		
		100%	75%	50%
Mechanical efficiency	%	35,3	32,8	26,5
Thermal efficiency	%	47,0	49,1	55,2
Total efficiency	%	82,3	81,9	81,7

Mass flows

All data is based on measured values. The tolerance for specific fuel consumption is +5% at rated output

KVT-E70SI - Cogeneration unit

Rating @ 1500 rev/min	Units	Metric		
		100%	75%	50%
Combustion air	Kg/h	224	185	157
Fuel	Kg/h	18	14,5	12
Exhaust gas mass flow rate wet	Kg/h	241,3	199,3	169,1
Exhaust gas temperature	°C	665	650	630

Note: All data based on a grid coupled CHP set

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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 Perkins inhibitor in the cooling system. The inhibitor is available in 1 litre bottles from Perkins.

Total coolant capacity (engine only) .. 21 litres
Maximum jacket water pressure in crankcase ... 1.5 bar

Jacket cooling water data	Units	1500 rev/min
Coolant flow	l/m	142
Coolant exit temperature (max)	°C	96
Coolant entry temperature (max)	°C	84

Shutdown switch setting... coolant 118 °C rising
Recommended operating range... 84 / 90 °C

Lubrication system

Recommended lubricating oil: Lubricating oil requirements vary with fuel used. Full specifications including oil sampling and recommendations and condemnation limits appear on the fuel, coolant and lubricating oil recommendation sheet for the 1104 Series Gas Engines.

Lubricating oil capacity

Sump option .. G0002
Lubricating oil capacity total system .. 15,5 litres
Maximum sump capacity .. 14.9 litres
Minimum sump capacity .. 12.4 litres
Maximum engine operating angles
-front up, front down, right side or left side. ...25°
Lube oil consumption... 0.03 kg/h

Lubricating oil temperature

Maximum oil temperature .. 125 °C
Oil pump .. Gear driven
Shutdown switch setting... oil 0,90 bar falling

Exhaust system

Maximum permitted back pressure of the complete exhaust system is 4.0 kPa (40 mBar).

Fuel system

Recommended fuel: Natural Gas LHV at 31.6 MJ/m³. Other fuels may be used, for example landfill or digester 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 be made to Kemper en Van Twist Gas B.V. to determine suitability. Gas supplies must be filtered to the same standard as the engine intake air (i.e. Maximum particle size not to exceed 50 microns).

Gas supply pressure ... 1,5 kPa to 5 kPa at full rated flow
Carburetor type .. IMPCO CA200 mixer

Installation of gas supply and shut off valves to be in accordance with local regulations.

Ignition system

Primary system .. Woodward
Primary voltage .. 12 volts
Polarity .. Negative earth
Spark plug gap .. 0,25 mm
Ignition timing .. 20° BTDC

Electrical system

Type .. Insulated return
Starter motor .. 12 volts
Starter motor power .. 4.2 kW
Number of teeth on flywheel... 126
Number of teeth on starter motor ... 10
Minimum cranking speed .. 120 rev/min

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