

# Perkins based INDUSTRIAL GAS ENGINES

## Technical Data ElectropaK NG KVT-E44SI

### Gas Engine

#### Basic technical data

Number of cylinders .. 4  
 Cylinder arrangement .. Vertical, In line  
 Cycle .. 4 stroke, spark ignition  
 Induction system .. Naturally aspirated  
 Compression ratio .. 12.1:1  
 Bore .. 105 mm (4.13 in)  
 Stroke .. 127 mm (4.99 in)  
 Cubic capacity .. 4,4 litres  
 Direction of rotation .. Anti-clockwise viewed on flywheel  
 Firing order .. 1, 3, 4, 2  
 Cylinder 1 .. Furthest from flywheel  
 Total weight of electro unit (engine only)  
 - estimated total weight (dry) .. 475 kg  
 - estimated total weight (wet) .. 500 kg

#### Overall dimensions

-height .. 915 mm  
 -length .. 1162 mm  
 -width .. 652 mm

#### Moments of inertia (mk<sup>2</sup>)

-engine flywheel .. 1,14 kgm<sup>2</sup>

#### Centre of gravity

	Unit	Wet	Dry
Forward from rear of block	mm (in)	258 (10.16)	251 (9.88)
Above centre line of block	mm (in)	157 (6.18)	146 (5.75)
Offset to Rhs of centre line	mm (in)	23 (0.91)	21 (0.83)

#### Performance

All data based on operation to ISO 14396, ISO 3046/1 standard reference conditions.  
 Speed variation at constant load .. ISO 8528 G2 (Mech) ± 5 %

#### Test conditions

-air temperature .. 25 °C (77 °F)  
 -barometric pressure .. 100 kPa (29.5 in hg)  
 -relative humidity .. 30%  
 -natural gas LCV .. 31,65MJ/Nm<sup>3</sup>

#### Cooling system

Radiator  
 -weight (dry) .. 10 Kg  
 -face area .. 0,28 m<sup>2</sup> (2.97 ft<sup>2</sup>)  
 -rows and materials .. single row aluminium  
 -matrix density and material .. aluminium 12,7 fins/inch  
 -width of matrix .. 526 mm (20.7 in)  
 -height of matrix .. 524 mm (20.6 in)  
 -pressure cap setting .. 107 kPa (15.5 lb/in<sup>2</sup>)

#### Fan

-diameter .. 457 mm (18 in)  
 -drive ratio .. 01:01  
 -number of blades .. 7  
 -material .. composite  
 -type .. pusher  
 -power @ 1500 rev/min .. 0,9

**Caution:** The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 53 °C (127 °F) or 46 °C (115 °F) if a canopy is fitted with an air flow restriction of up to 0,125 kPa. If the power unit is to be enclosed totally, a cooling test should be done to check that the engine cooling is acceptable. If there is insufficient cooling, contact Kemper en Van Twist Technical Service Department.

#### General installation

Designation	Units	Type of operation and application			
		Prime	Stand-by	Prime	Stand-by
		50 Hz	50 Hz	60 Hz	60 Hz
Gross engine power	kW	39.7	43.0	46.6	50.0
Mean piston speed	m/s	6,35	6,35	7,62	7,62
ElectropaK net engine power	kW	38.8	42.1	45.0	48.4
Engine coolant flow (coolant pump ratio 1.25:1)	l/min	143	143	169	169
Fuel consumption	Nm <sup>3</sup> /hr	12.9	13.9	15.1	16.2
Combustion air flow	kg/min	2,8	2,8	3,7	3,7
Exhaust gas temperature (max)	°C	600	600	630	630
Cooling fan air flow (zero duct allowance)	m <sup>3</sup> /min	58,2	58,2	81,6	81,6
Typical Genset Electrical output (0.8pf 25 °C)	kWe	34.9	36.6	40.5	43,9
	kVA	41.25	45.8	47.2	50.5
Assumed alternator efficiency	%	90			

**Note:** Cooling fan air flow (zero duct allowance) at 60 Hz Stand-by assumes 1.25:1 fan ratio and 120 kPa restriction

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## Coolant

Total system capacity

-with radiator ..... 12,8 litres (23.2 UK pints)  
-without radiator ..... 7,0 litres (12.3 UK pints)  
Maximum top tank temperature ..... 110 °C (230 °F)  
Maximum permissible external system resistance ..... 35 kPa  
Thermostat operation range..... 82 - 93 °C (180 - 199 °F)  
Coolant pump ratio and method of drive ..... gear driven 2:1  
Recommended coolant immersion heater rating .. ...TBA kW  
Recommended coolant:  
50% ethylene glycol with a corrosion inhibitor (BS 658 :1992 or MOD AL39) and 50% clean fresh water.

## Exhaust system

Maximum permitted back pressure of the complete exhaust system is 10.2 kPa  
Exhaust outlet size ..... 64 mm (2.5 in)

## Fuel system

Recommended fuel: Natural Gas LHV at 31.6 MJ/m<sup>3</sup>. 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  
Carburettor type ..... Impco with zero pressure regulator

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

## Ignition system

Primary system ..... Gill  
Primary voltage ..... 12 volts  
Polarity ..... Negative earth  
Spark plug gap ..... 0,25 mm  
Ignition timing ..... 18° BTDC

## Electrical system

Type ..... Insulated return  
Starter motor ..... 12 volts  
Starter motor power ..... 3 kW  
Number of teeth on flywheel..... 126  
Number of teeth on starter motor ..... 10  
Minimum cranking speed ..... 120 rev/min

## Lubrication system

### Lubricating oil capacity

Total system..... 8,0 litres (14.1 UK pints)  
Minimum ..... 5,5 litres (9.7 UK pints)  
Maximum ..... 7,0 litres (12.3 UK pints)  
Maximum engine operating angles  
-front up, front down, right side or left side. .... 25° continuous  
Sump drain plug tapping size. .... ¾ in x 16 UNF  
Shutdown switch setting (where fitted) .. ... 60 - 90 kPa  
Oil pump speed and  
method of drive ..... gear driven @ 2 x engine speed  
Oil pump flow:  
1500 rev/min ..... 42 litres/min  
1800 rev/min ..... 51 litres/min

### Lubricating oil pressure

-relief valve opens..... 415 - 470 kPa (60 - 68 lbf/in<sup>2</sup>)  
-at maximum no-load speed .. ... 276 - 414 kPa (40 - 60 lbf/in<sup>2</sup>)  
Maximum continuous oil temperature (in rail) ..... 125 °C (257 °F)  
Oil consumption at full load as a % of fuel consumption:..... 0,15%