

4000 Series 4016-61TRS1 Spark Ignited Gas Engine

912 kWm @ 1500 rpm

Developed from a proven engine range that offers superior performance and reliability, the 4016-61TRS is designed to meet the future demands of the power generation industry for clean, efficient gas fuelled engines.

The 4016-61TRS 16-cylinder spark ignition gas engine offers high performance, dependability and reliability whilst meeting the market's increasingly stringent emission requirements.

The 4016-61TRS is a turbocharged, air to water charge cooled 16 cylinder inline engine, designed for operation on a wide range of methane based gases.

Its premium features and design provide economic and durable operation as well as exceptional mechanical efficiency and power-to-weight ratio, whilst offering improved emissions. The overall performance and reliability characteristics make this the prime choice for today's power generation industry.



Specification		
Number of cylinders	16 60° Vee	
Bore and stroke	160 x 190 mm	6.3 x 7.5 in
Displacement	61.12 litres	3730 in ³
Aspiration	Turbocharged and air-to-water charge cooled	
Cycle	4 stroke	
Combustion system	Spark ignition	
Compression ratio	12:1	
Rotation	Anti-clockwise, viewed on flywheel	
Total lubricating capacity	286 litres	75.5 US gal
Cooling system	Water-cooled	
Total coolant capacity	95 litres	25.1 US gal

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THE HEART OF EVERY GREAT MACHINE

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Features and benefits

Economic power

- Utilises advanced combustion technology to deliver durable and reliable power
- High commonality of components with other engines in the 4000 Series family for reduced stocking levels
- Individual large valve cylinder heads with matched deep bowl pistons for greater swirl, achieve high mechanical efficiency

Reliable power

- Developed and tested using the latest engineering techniques
- Piston temperatures controlled by an advanced gallery jet cooling system
- Extended durability and reduced servicing with extended component life add benefit of the reduced whole life cost
- Robust to varying gas quality
Specs for both natural gas and biogas are available*

Compact, clean, and efficient power

- Exceptional power-to-weight ratio and compact size give optimum power density for ease of transportation and installation
- In excess of 40% mechanical efficiency
- Designed to provide excellent service access for ease of maintenance
- Engines to comply with major international standards
- All engines in the 4000 Series family are capable of meeting the NOx requirements of TA Luft

Product support

- With highly trained Perkins distributors in thousands of communities in over 180 countries, you are never far away from expert product knowledge, genuine parts and a range of advanced diagnostic technology for keeping your engine in peak condition
- **Warranties and Service Contracts**
We provide a class leading warranty for the 4000 Series engine range - one year unlimited hours; two years 6,000 hours or three years 1,500 hours
- To find your local distributor: www.perkins.com/distributor

*Engine specification suitable for running on landfill gas, digester gas, biogas and coal bed mine gas. (Please contact your account manager or nearest distributor for more information)

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Technical information

Core engine

- High grade cast iron featuring integral crankcase inspection doors
- Wet type liners in centrifugal cast iron, plateau honed for quick ring bedding and reduced oil consumption
- Forged steel crankshaft
- Forged camshaft – carburised hardened
- High grade cast iron individual cylinder heads, each with four valves per cylinder
- Crankshaft driven gear train for camshaft
- Aluminium alloy piston with advanced bowl design. Three ring pack, gallery (oil) cooled
- Split cap connecting rods, forged steel with multi-bolt fixing – shot peened

Air inlet and exhaust

- Mounted air filter – replaceable cartridge type
- Dry exhaust manifolds
- Exhaust manifold shielding
- High efficiency turbocharger

Governing, gas and ignition system

- Choice of control systems - Elecktra AFR / Heinzmann krono 20 AFR / Manual mixture adjustment screw
- Altronic 800 'C' Series ignition system with individual cylinder ignition coils, spark plugs
- Digital governing system, governing to ISO8528-5 class G2

Lubrication system

- Gear driven, externally mounted lubricating oil pump
- Wet sump with filler and dipstick
- Full-flow replaceable canister type oil filters
- Jacket water cooled shell and tube oil cooler/stabiliser
- Closed circuit crankcase ventilation system – natural gases only. Open breather - biogas

Cooling system

- Pressurised jacket water cooling system, gear-driven jacket water, circulating pump – supply on Electro Unit only
- Air to water chargecooler, pipe work – supply on Electro Unit only
- Jacket water thermostatic control – supply on Electro Unit only

Electrical equipment

- 24 volt starter motor
- 24 volt 70 amp battery charging alternator with integral voltage, regulator and activating switch – supply on Electro Unit only
- High coolant temperature switch
- Low oil pressure switch
- High manifold pressure switch
- Digital knock detection

Flywheel and housing

- High inertia flywheel to SAE J620 Size 18
- SAE '00' flywheel housing

Mountings

- Front and rear engine mounting support

Optional equipment

- Air cleaner with cyclone type pre-cleaner in lieu of standard
- Cold weather kit for closed circuit breather (blanket)
- Immersion heater kit including thermostats (220/240V-1 Ph-50Hz)
- Second electric starting system
- KWe sensor for use with all Heinzmann electronic AFR control systems (supplied loose) enabling closed loop operation
- Overspeed protection relays including magnetic pick-up
- Additional magnetic pick-up in flywheel housing
- K-Type exhaust port thermocouples per cylinder (supplied fitted)
- Engine driven raw water pump for mixture charge cooling water (Electro Unit spec)
- Thermostat(s) 3-way, for mixture charge cooling system
- Barring over tool
- Drilled and tapped engine side door (1/4 BSP)
- TV damper guard (Electro Unit specifications, when drive pulley not required)

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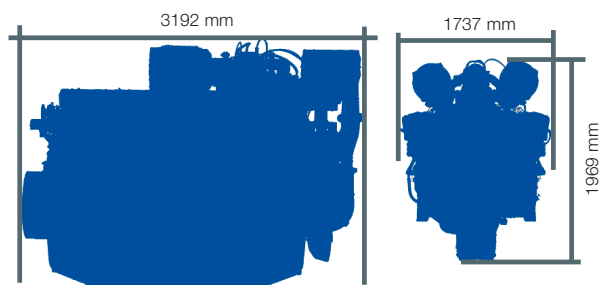
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Engine package weights and dimensions

Length	3192 mm	126 in
Width	1737 mm	68 in
Height	1969 mm	78 in
Weight (dry)	5820 kg	12831 lb

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Speed rpm	Type of operation	Typical generator output (Gross)	Engine power (Gross)
		kWe	kWm
1500	Continuous operating power	875	912

The above ratings represent the engine performance capabilities to conditions specified in ISO 8528/1, ISO 3046/1:1986, BS 5514/1. Derating may be required for conditions outside these; consult Perkins Engines Company Limited.

Generator powers are typical and are based on an average alternator efficiency and a power factor (cos. θ) of 1.

Fuel specification: Natural gas having a Lower Calorific Value of 34.71 MJ/m³.

Rating definitions

Continuous operating power: Power available for true baseload, rating as defined in ISO 8528/1, BS 5514/1 – No overload permitted.

Fuel consumption gross at 1500 rpm (kJ/kWs)		
Continuous baseload rating	Cogeneration unit	Electro unit
100%	2.51	2.56
75%	2.6	2.63
50%	2.68	2.7
25%	2.75	2.77

Fuel consumption figures are for TA Luft compliant engines at ISO 8528/1 in "Cogen" engine specification, running on British natural gas with LCV 34.71 MJ/Sm³

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