

Cummins natural gas generating set

Specification sheet

500 kVA Prime



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Cummins GTA-2300-G is simple in design and a proven workhorse, which has clocked millions of hours, operating in some of the most demanding conditions like oil field, textile, tea gardens etc. Cummins gas generating set has unique design features which allows operation on various natural gas fuels. It also incorporates the latest technology that provides high engine performance, low emission and greater load bearing capacity.

Characteristics

- Cummins 12 cylinder, Vee configuration, 4 stroke, watercooled engine, 1500 RPM, rating conforming to ISO 3046 / BS 5514
- Stamford, self-excited and self regulated brushless alternator at 0.8 power factor, 415V, 3 phase, 50 Hz. Specially designed MS fabricated base frame.
- Key performance components manufactured to exacting Cummins standards
- Genset manufactured as per Cummins Recommendations Prime power rating as per ISO 8528

Benefits

- Environment friendly
- Low noise level
- Greater load bearing capacity
- Proven reliability and durability
- Nation-wide service network
- Unmatched warranty: 2 years / 5000 hours
- Single window after-sale support round the clock
- Extended oil change period (1000 hrs)
- Lower operating cost

Standard scope

Engine:

- Cummins K series, open chamber combustion, turbocharged aftercooled, watercooled engine, 12 cylinder, 4 stroke, rated at 1500 RPM, conforming to ISO 3046 / BS 5514 has the following specifications
- Carburetor, altronic ignition timer, ignition tranformer, spark plug, electronic governor
- Stainless steel exhaust flexible connection, residential type silencer
- Heat exchanger for jacket water cooling and 1 exclusive for aftercooler water circuit, water pumps for jacket water & aftercooler circuit, coolant inhibitor
- Shell and tube type lube oil cooler
- Full flow, replaceable element type main and by-pass lube oil filter, gas filter, dry type replaceable paper element air cleaner with restriction indicator
- Flywheel housing and flywheel to suit double bearing alternator
- 1st & 11nd stage pressure regulating valves, mechanical shut off valve, 24 VDC electrical shut off valve
- 24 V DC Electric starting motor, battery charging alternator
- Engine control panel
- Engine protections for high water temperature, low lube oil pressure, overspeed
- First fill lube oil
- Exhaust temperature gauge, watercooled exhaust

Alternator:

- Stamford brushless alternator
- Self-excited, self regulated
- Salient pole revolving field
- Automatic voltage regulator

Control panel:

Powder coated control panel manufactured with 14/16 gauge CRCA sheet and provides:

- ACB of suitable rating with undervoltage release, overload relay with short circuit protection
- Voltmeter and Ammeter with selector switch
- Frequency meter
- KW, KWh and Power Factor meters
- Indicating lamps for "Load On" and "Set Running"
- Current transformers
- Instrument fuses duly wired and ferruled
- Aluminium busbars of suitable capacity with incoming and outgoing termination

Battery:

- 4 x 12 V, 27 plates, dry, uncharged batteries with connecting leads and terminals

Optionals**Engine**

- Spark arrester silencer
- Air starting system

Alternator

- Thermister
- PMG excitation
- Space heater

Control Panel

- AMF control panel
- Battery charger
- Remote and auto start panel
- Auto / Manual synchronising panel
- Indicating lamps for engine faults / Audio / Visual annunciation

Others

- Acoustic enclosure
- Weatherproof enclosure

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PGBU/CIL/001/Natural Gas 500 kVA/CPG/April 2009/Qty.



Technical data

Generator set specifications

Gas Generating Set - Typical Maximum KWe Prime Power Rating at 50 Hz (0.8 p.f.)	400 - Heat Exchanger Cooling
Gas Generating Set - Typical KWe Baseload Power Rating at 50 Hz (0.8 p.f.)	320 - Heat Exchanger Cooling
Output Voltage and Frequency	415 Volts, 50 Hz
Power Factor	0.8 (lag)
No.of Phases	3 Phase
Overall Genset Dimensions (mm) Length x Width x Height (Dry weight)	4700 x 2460 x 2030 (9700)

Engine specifications

Engine Model	GTA - 2300 - G	
No. of Cylinders	12	
Aspiration	Turbocharged Aftercooled	
Bore - mm	159	
Stroke - mm	159	
Displacement - liter	37.8	
Engine Output Prime - KWm (maximum)	447.6	
Engine Output Baseload - KWm (maximum)	358.1	
Piston Speed - m / s	7.9	
Break Mean Effective Pressure (BMEP) - kPa	947	
Overall Engine Dimensions Length (Engine Only) x Width (Engine Only) x Height (Engine Only)	1993 x 1505 x 1723	
Dry weight of engine	5110	
Engine Rating at 1500 RPM (BHP) Piston Compression Ratio	12.0 : 1	
	10.0 : 1	600
	8.5 : 1	570
Compression Ratio (for following data) ****	8.5:1	
Natural Gas Consumption for Gas Calorific Value (970 BTU/CFT or 8632 KCal/SM3) SCM/Hr	136	
Exhaust Temperature (Stack) Deg C	521	
Energy Input - KW	1363	
Energy Output - KW	448	
Heat Rejected to Jacket Water - KW	502	
Heat Rejected to Aftercooler LTA Circuit - KW	55	
Heat Rejected to Exhaust - KW	332	
Heat Rejected to Ambient + Unaccounted + Unburnt - KW	27	
Air Flow (Lit/Sec)	471	
Exhaust Gas Flow - Lit / Sec	1293	
Exhaust System Permissible Back Pressure - mm Hg	76.2	
Engine Water Flow - (Lit / min)	936	
After Cooler Circulating Water Flow - (Lit/Min)	266	
Raw water flow for Engine side Heat Exchanger (92 deg F / 32 deg C water inlet temperature) - Lit / min	1552	
Raw water flow for Aftercooler Heat Exchanger (92 deg F / 32 deg C water inlet temperature)	320	
Recommended Cooling Tower Capacity (TR)	150	
Main Line Pipe size (mm)	65	
Main Line Gas Pressure (kg/cm ²)	1.4	

Data is indicative and could vary based on gas composition and site conditions.

Data is based on typical natural gas with 970 BTU / CFT heat valve.

Conformance standards

IS 4722, BS 5000, IS 1460, ISO 8528, BS 5514, ISO 3046

Rating definitions

Prime Power (PRP):

Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

- Fuel consumption data is based on diesel having specific gravity of 0.85 and conforming to IS:1460
- Oil consumption data is based on oil having specific gravity of 0.89 and meeting CF4 API categories
- Fuel consumption tolerance is +5%

Emergency Standby Power (ESP):

Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.

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