

YC6TH1070-D31

Prime power: 715 kW @ 1500 r/min

Standby power: 787 kW @ 1500 r/min



Definitions

Prime Power

It corresponds to the prime rated power (PRP) of GB/T 2820 and ISO 8528, and refers to the maximum power accessible at the variable load for an unlimited running hours per year, with the maintenance intervals and procedures being carried out as prescribed by Yuchai, and the allowed average output power within 24 h shall not be higher than 70% of the prime power.

Standby Power

It corresponds to the emergency standby power (ESP) of GB/T 2820 and ISO 8528, and refers to the maximum power accessible at a certain variable load series in the event of a utility power outage or under test conditions for an limited running hours up to 200 h per year, with the maintenance intervals and procedures being carried out as prescribed by Yuchai. The allowed average output power within 24 h shall not be higher than 70% of the standby power.

Main technical parameters

| | |
|--|---|
| Number of cylinders | 6 |
| Configuration | Vertical, in-line |
| Aspiration | Turbocharged, air-air intercooled |
| Combustion system | Direct injection |
| Compression ratio | 14:1 |
| Bore | 175 mm |
| Stroke | 195 mm |
| Displacement | 28.14 L |
| Rotation | Counterclockwise (viewed from the flywheel end) |
| Firing order (viewed from the belt pulley end) | 1-5-3-6-2-4 |
| Dry weight (without radiator) | 3400 kg |
| Wet weight (without radiator) | 3567 kg |

Overall dimensions

| | |
|---|---------|
| Length (from front end of radiator to rear end of air filter) | 2817 mm |
| Width(with radiator) | 2000 mm |
| Height (with radiator and mounting support) | 1992 mm |

Centre of gravity (dry engine, with the center of the rear end face of the flywheel shell as the origin)

| | |
|---|----------|
| From the rear end face of the flywheel | 941.1 mm |
| Height relative to the center of the crankshaft | 276.1 mm |

Centerline deviation relative to the crankshaft center gravity (Move to the exhaust pipe side)

Moments of rotation inertia

| | |
|----------------|-------------------------|
| Engine | 15.14 kg·m ² |
| Flywheel | 9.85 kg·m ² |

Performance rating

| | |
|-------------------------------|---------|
| Speed droop | ≤ 1 % |
| Steady state speed band | ≤ 0.5 % |

Test conditions

| | |
|--|----------|
| Ambient temperature | 25 °C |
| Atmospheric pressure | 100 kPa |
| Relative humidity | 30 % |
| Max. operating intake resistance | ≤ 5 kPa |
| Exhaust backpressure limit | ≤ 10 kPa |
| Fuel temperature (fuel inlet pump) | 38±2 °C |

Attention: Unless otherwise explicitly specified, all parameter data are measured under standard test condition as above. If the engine is operated under other test conditions rather than the test condition above, it shall be adjusted properly according to the actual environment. Contact the Yuchai Technical Service Department for details.

Matching parameters

| Designation | Unit | Matching parameters | |
|--|---------------------|---------------------|--------|
| | | Standby | Prime |
| | | 50 Hz @ 1500 r/min | |
| Gross engine power | kW | 787 | 715 |
| Net engine power | kW | 752 | 680 |
| Fan power consumption (belt pulley driven) | kW | 34 | 34 |
| Other power loss | kW | 1 | 1 |
| Mean effective pressure | MPa | 2.23 | 2.03 |
| Intake air flow | m ³ /min | 51.94 | 48.55 |
| Exhaust temperature limit (after turbocharger) | °C | ≤550 | ≤550 |
| Exhaust flow | m ³ /min | 128.79 | 117.02 |
| Boost pressure ratio | / | 3.34 | 3.06 |
| Thermal efficiency | % | 39.98 | 40.61 |
| Mean piston speed | m/s | 9.75 | 9.75 |
| Coolant flow | L/min | 1000 | 1000 |
| Cooling fan air flow | m ³ /min | 1700 | 1700 |
| Typical gen-set electrical output (power factor:0.8) | kW | 710 | 650 |
| | kVA | 887.5 | 812.5 |
| Assumed generator efficiency | % | 94.4 | 95.6 |

Energy balance parameters

Note: The calorific value of diesel is 42,770 kJ/kg

| Designation | Unit | Energy balance parameters | |
|--|------|---------------------------|-------|
| | | Standby | Prime |
| | | 50 Hz @ 1500 r/min | |
| Total fuel chemical energy | kW | 1952 | 1759 |
| Output power (gross) | kW | 787 | 715 |
| Output power (net) | kW | 757 | 685 |
| Fan power consumption | kW | 29 | 29 |
| Other power loss | kW | 1 | 1 |
| Heat dissipation capacity(coolant circulation) | kW | 428 | 391 |
| Heat dissipation capacity(intake intercooled system) | kW | 170 | 150 |
| Heat dissipation of exhaust | kW | 522 | 463 |
| Heat dissipation of thermal radiation | kW | 45 | 40 |

Cooling system

| | |
|--|-----------|
| Total coolant capacity..... | 214 L |
| Engine coolant capacity..... | 66 L |
| Radiator coolant capacity..... | 142 L |
| Pipeline coolant capacity..... | 6 L |
| Engine max. outlet coolant temperature..... | 97°C |
| Pressure difference between inlet and outlet of water pump (max. hydrostatic head)..... | 150 kPa |
| Thermostat operation temperature | |
| Initial open..... | (75±2)°C |
| full open..... | <(85±2)°C |

Intake system

Air filter

Max. intake resistance:

-Clean air filter 2.45 kPa

-Dirty air filter 5 kPa

-Air filter type.....Dry-type, filter cartridge of paper

Inclination

Transverse inclination/longitudinal inclination (volume of engine oil sump: 155 L) 15°/ 5°

Fuel system

Injection system.....Electronic unit pump

Parameters of YC6TH1070-D31 Diesel Engine(Basic Type) for Genset

Max. coolant temperature rise:

-Standby power.....8℃
 -Prime power.....7℃

Radiator

Cooling area.....439 m²
 Dry weight.....600kg
 Core material.....aluminum
 Number of lines.....190
 Density of core.....13 cooling fins/inch
 Width of core.....1924 mm
 Height of core.....1520 mm
 Min. pressure of pressure cap.....(50±5)kPa
 Coolant resistance limit.....20 kPa

Intercooler

Cooling area.....146 m²
 Core material.....aluminum
 Number of lines.....120
 Density of core.....12 cooling fins/inch
 Width of core.....1920 mm
 Height of core.....1470 mm
 Air resistance limit.....15 kPa

Coolant pump

Rotation speed.....3240 r/min
 Drive mode.....Pulley driven

Fan

Diameter.....1442 mm
 Drive ratio.....1.36:1
 Material.....Steel
 Number of blades.....8
 Type.....Blowing

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Injector

Type.....Mechanical
 Injector opening pressure(32~34) MPa

Fuel pump

Drive mode Gear driven
 Fuel delivery pump flow @1,500 rpm≥12 L/min
 Max. fuel inlet temperature limit..... 75 ℃
 Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure).....60 kPa
 Maximum fuel return pressure of fuel pump(absolute pressure) 171 kPa

Fuel filter

Pre- filter

Rated flow..... 15 L/min
 Max. original resistance 15 kPa
 Water separation efficiency at the rated flow ≥95 %
 Filter efficiency:
 For particles of 25 μm.....99 %
 For particles of 10 μm.....85 %

Fine- filter

Rated flow..... 14 L/min
 Max. original resistance 10 kPa
 Filtering efficiency:
 For particles of 6 μm99.9 %
 For particles of 4 μm99.6 %

Fuel consumption

Note: The density of diesel is 0.835 kg/L.

| Load condition | 1500 r/min | |
|----------------|------------|-------|
| | g/(kW·h) | L/h |
| Standby | 208.8 | 196.8 |
| Prime | 207.1 | 177.3 |
| 75% prime | 218.6 | 140.4 |
| 50% prime | 225.9 | 96.7 |

Lubricating system

- Total oil capacity(dry engine) 113 L
- Total oil capacity(oil change) 110 L
- Oil sump capacity - low level/high level 73/105 L
- Max. oil temperature (in oil sump) 120 °C
- Operating oil temperature(in oil sump)..... (90~115) °C
- Oil pressure(idle speed) ≥150 kPa
- Oil pressure(rated speed)..... (250~500) kPa
- Oil-fuel consumption ratio <0.3%

Oil filter

The filtering efficiency at the rated flow of 44 L/min and the assembly initial resistance ≤25 kPa:

- For 15µm≤particles<20µm.....>75 %
- For 20µm≤particles<30µm.....>95%
- For 30µm≤particles<40µm.....>99%
- For particles≥40µm.....>99.9999%

Electric system

Type.....Negative ground

Charger

- Voltage 28V
- Output current 27A

Starter

- Type Electric start, 2
- Voltage 24V
- Power 7.5 kW
- Number of teeth of flywheel..... 140
- Number of teeth of starter..... 10

Cold start (test data, for reference only)

| 24 V | | | | | |
|---|-------|-----|-----|-----|-----|
| Battery specification × quantity: ≥12V/195Ah×4. And the min CCA of Battery should be 1100A when apply to cold area and plateau area. | | | | | |
| Starting temperature | °C | -15 | -20 | -25 | -30 |
| Starting speed | r/min | / | / | / | / |
| Starting current | A | / | / | / | / |
| Starting voltage | V | / | / | / | / |
| Starting time | s | / | / | / | / |
| Preheating time | s | / | / | / | / |

Auxiliary intake heater

Type...../

Specification /

Water preheater

Recommended specification.5 kW/220 V

Engine preheater water outlet interface..... NPT 1

Engine preheater water inlet interface NPT 1

Oil heater

Recommended specification.1kW/220 V

Interface (oil sump, 2)..... M22×1.5

Exhaust system

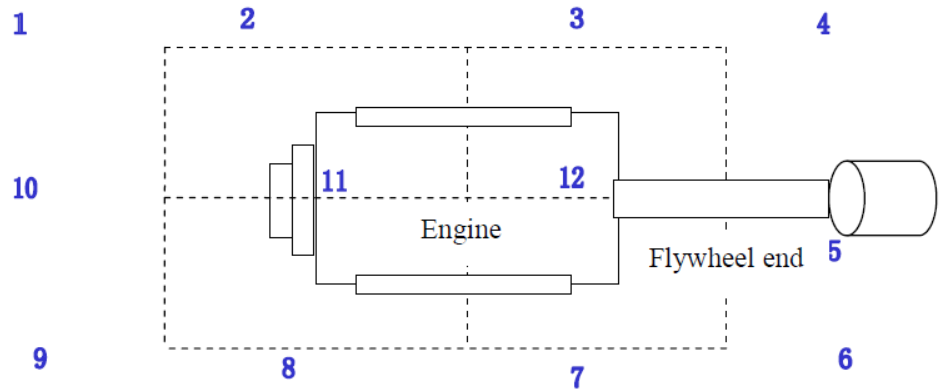
Max. exhaust backpressure..... 10 kPa

Inner diameter of exhaust port pipe..... Φ250 mm

Noise

Noise data (715 kW @ 1500 r/min)

| Position | Noise, dB(A) |
|----------|--------------|
| 1 | 106.1 |
| 2 | 108.0 |
| 3 | 106.5 |
| 4 | 105.4 |
| 5 | 104.8 |
| 6 | 105.5 |
| 7 | 107.1 |
| 8 | 107.7 |
| 9 | 105.4 |
| 10 | 103.9 |
| 11 | 107.8 |
| 12 | 105.3 |



Noise spectrum (715 kW @ 1500 r/min)

| Frequency, Hz | Noise, dB(A) |
|---------------|--------------|
| 63 | 60 |
| 125 | 78 |
| 250 | 88 |
| 500 | 95 |
| 1K | 94 |
| 2K | 96 |
| 4K | 95 |
| 8K | 96 |

