Version: 2021V01 Implemented on: Novemder 1, 2021

YC6C1520-D31

Prime power: 1016 kW @ 1500 r/min

Standby power: 1118 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 13.5:1

Bore ..... 200 mm

Stroke ..... 210 mm

Displacement ..... 39.58 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) ..... 4500 kg

Wet weight (without radiator) ..... 4780 kg

Overall dimensions

Length (from front end of radiator to rear end of air filter)

..... 3530 mm

Width ..... 2150 mm

Height (with radiator and mounting support) ..... 2322 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 ..... 1006.8 mm

Height relative to the center of the crankshaft ..... 0.3 mm

Centerline deviation relative to the crankshaft center gravity

..... 261.4 mm

Moments of rotation inertia

Engine ..... 24.19 kg·m^2

Flywheel ..... 15.38 kg·m^2

Performance rating

Speed droop ..... ≤1 %

Steady state speed band ..... ≤0.5 %

Test conditions

Ambient temperature ..... 25 ℃

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 ℃

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 @ 1,500 r/min	
Gross engine power	kW	1118	1016
Net engine power	kW	1072	972
Fan power consumption (belt pulley driven)	kW	33	33
Other power loss	kW	13	11
Mean effective pressure	MPa	2.25	2.05
Intake air flow	m^3 /min	76.37	68.96
Exhaust temperature limit (after turbocharger)	℃	550	550
Exhaust flow	m^3 /min	198.4	170.3
Boost pressure ratio		3.6	3.4
Thermal efficiency	%	39.5	40.4
Mean piston speed	m/s	10.5	10.5
Coolant flow	L/min	870	870
Cooling fan air flow	m^3 /min	1700	1700
Typical gen-set electrical output (power factor:0.8)	kW	1000	900
	kVA	1250	1125
Assumed generator efficiency	%	93.3	92.6

Thermal balance parameters

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

Designation	Unit	Thermal balance parameters	
		Standby	Prime
		50 Hz @ 1,500 r/min	
Total fuel chemical energy	kW	2833	2512
Output power (gross)	kW	1118	1016
Output power (net)	kW	1072	972
Fan power consumption	kW	33	33
Other power loss	kW	13	11
Heat dissipation capacity(coolant circulation)	kW	440	410
Heat dissipation capacity(intake intercooled system)	kW	250	230
Heat dissipation of exhaust	kW	888	735
Heat dissipation of thermal radiation	kW	137	121

Heat dissipating capacity of Yuchai engine with C6B00-1316100 radiator at an ambient temperature of 50℃ is as follows:

Designation	Unit	Thermal balance parameters	
		Standby	Prime
		50 Hz @ 1,500 r/min	
Total fuel chemical energy	kW	2888	2563
Output power (gross)	kW	1118	1016
Output power (net)	kW	1072	972
Fan power consumption	kW	33	33
Other power loss	kW	13	11
Heat dissipation capacity(coolant circulation)	kW	465	435
Heat dissipation capacity(intake intercooled system)	kW	260	232
Heat dissipation of exhaust	kW	898	745
Heat dissipation of thermal radiation	kW	147	135

Cooling system

Total coolant capacity.....230 L

Engine coolant capacity.....90 L

Radiator coolant capacity.....127 L

Pipeline coolant capacity.....13 L

Engine max. outlet coolant temperature.....97℃

Pressure difference between inlet and outlet of water pump (max. hydrostatic head).....150 kPa

Thermostat operation temperature

Initial open.....(75±2)℃

full open.....＜(85±2)℃

Max. coolant temperature rise:

-Standby power.....8℃

-Prime power.....7℃

Radiator

Cooling area.....366 m^2

Dry weight.....996kg

Core material.....aluminium

Number of lines.....200

Density of core.....13 cooling fins/inch

Width of core.....2056 mm

Height of core.....1750 mm

Min. pressure of pressure cap.....(50±5)kPa

Coolant resistance limit.....25 kPa

Intercooler

Cooling area.....152 m^2

Core material.....aluminium

Number of lines.....126

Density of core.....11 cooling fins/inch

Width of core.....2048 mm

Height of core.....1730 mm

Air resistance limit.....15 kPa

Coolant pump

Rotation speed.....2864 r/min

Drive mode.....gear driven

Fan

Diameter.....1442 mm

Drive ratio.....1.36:1

Material.....steel

Number of blades.....8

Type.....Blowing

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) .....20°/ 10°

Fuel system

Injection system.....electronic unit pump

Injector

Type.....Electronically controlled injector, with multiple jets

Injector opening pressure .....(26~27) MPa

Fuel pump

Drive mode ..... Gear driven

Fuel delivery pump flow @1,500 rpm ..... 10 L/min

Max. fuel inlet temperature limit.....75 ℃

Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure).....100 kPa

Maximum fuel return pressure of fuel pump .....20 kPa

Fuel filter

Pre- filter

Rated flow..... 30 L/min

Max. original resistance ..... 7 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..... 30 L/min

Max. original resistance ..... 10 kPa

Filtering efficiency:

For particles of 10 μm.....99.8 %

For particles of 3 μm.....98.5 %

Fuel consumption

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

Load condition	1,500 r/min	
	g/(kW·h)	L/h
Standby	213.3	285.6
Prime	208.2	253.3
75% prime	223.4	203.9
50% prime	236.1	143.6

Lubricating system

Total oil capacity(dry engine) ..... 160 L

Total oil capacity(oil change) ..... 155 L

Oil sump capacity - low level/high level ..... 130/160 L

Max. oil temperature (in oil sump) ……...120 ℃

Operating oil temperature(in oil sump)…….. (90~115) ℃

Oil pressure(idle speed) .....≥120 kPa

Oil pressure(rated speed)..... (250~700) kPa

Oil-fuel consumption ratio.....＜0.1 %

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 35A

Starter

Type ..... .Electric start, 2

Voltage 24V

Power .....7.5 kW

Number of teeth of flywheel.....153

Number of teeth of starter.....10

Cold start (test data, for reference only)

24 V					
Battery specification × quantity: 12V/195Ah×4 Attention: the minimum CCA of battery should not be less than 1100A when applied to the cold area or plateau.					
Starting temperature	℃	-15	-20	-25	-30
Starting speed	r/min	140	130	110	105
Starting current	A	700	776	856	1100
Starting voltage	V	21.64	21.86	19.71	18.02
Starting time	s	4	5.5	5.0	5.5
Preheating time	s	0	20	40	60

Auxiliary intake heater

Type..... grating-type

Specification ..... 6 kW

Water preheater

Recommended specification. .....6 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, 1)..... M22×1.5

Exhaust system

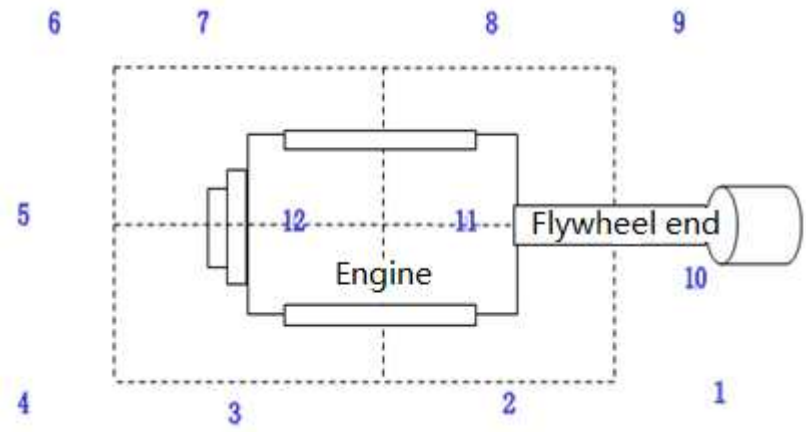
Max. exhaust backpressure..... 10 kPa

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

Noise

Noise data (1016 kW @ 1500 r/min)

Position	Noise, dB(A)
1	101.5
2	103.8
3	109.1
4	102.3
5	105.7
6	103.3
7	104.3
8	104.8
9	100.8
10	104.9
11	102.1
12	105



Noise spectrum (1016 kW @ 1500 r/min)

Frequency, Hz	Noise, dB(A)
63	56
125	69
250	84
500	92
1K	97
2K	93
4K	92
8K	90