Version: 2019V01 Implemented on: May 1, 2019

YC6B210L-D20

Prime power: 140 kW @ 1800 r/min

Standby power: 154 kW @ 1800 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 17.5:1

Bore ..... 108 mm

Stroke ..... 125 mm

Displacement 6.87L

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) .....700 kg

Wet weight (without radiator) ..... 760 kg

Overall dimensions

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

……...1720 mm

Width .....900 mm

Height (with radiator and mounting support)..... .....1200 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……..…412 mm

Height relative to the center of the crankshaft……..142mm

Centerline deviation relative to the crankshaft center gravity

……36 mm

Moments of rotation inertia

Engine .....2.01 kg·m^2

Flywheel .....1.75 kg·m^2

Performance rating

Speed droop ..... ≤0.5%

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
		60 Hz @ 1800 r/min	
Gross engine power	kW	154	140
Net engine power	kW	144	134
Fan power consumption (belt pulley driven)	kW	5	5
Other power loss	kW	0	0
Mean effective pressure	MPa	1.49	1.36
Intake air flow	m^3 /min	11.6	10.6
Exhaust temperature limit (after turbocharger)	℃	471	452
Exhaust flow	m^3 /min	19.7	17.8
Boost pressure ratio		2.35	2.27
Thermal efficiency	%	38.2	39.1
Mean piston speed	m/s	7.5	7.5
Coolant flow	L/min	158	158
Cooling fan air flow	m^3 /min	186	186
Typical gen-set electrical output (power factor:0.8)	kW	130	120
	kVA	162.5	150
Assumed generator efficiency	%	90.3	90.0

Energy balance parameters

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

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	403	358
Output power (gross)	kW	154	140
Output power (net)	kW	144	134
Fan power consumption	kW	5	5
Other power loss	kW	0	0
Heat dissipation capacity(coolant circulation)	kW	90	80
Heat dissipation capacity(intake intercooled system)	kW	31	26
Heat dissipation of exhaust	kW	114	99
Heat dissipation of thermal radiation	kW	19	14

Heat dissipating capacity of Yuchai engine with B7G20-1316100 radiator at an ambient temperature of 50℃ is as follows:

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	410	365
Output power (gross)	kW	154	140
Output power (net)	kW	144	134
Fan power consumption	kW	5	5
Other power loss	kW	0	0
Heat dissipation capacity(coolant circulation)	kW	90	81
Heat dissipation capacity(intake intercooled system)	kW	32	27
Heat dissipation of exhaust	kW	118	103
Heat dissipation of thermal radiation	kW	21	15

Cooling system

Total coolant capacity……..31 L

Engine coolant capacity……...12 L

Radiator coolant capacity……16 L

Pipeline coolant capacity……...3 L

Engine max. outlet coolant temperature……...99℃

Thermostat operation temperature

Initial open……..(70±2)℃

full open……..＜80℃

Max. coolant temperature rise:

-Standby power……8.0℃

-Prime power……7.8℃

Radiator

(drawing number：B7G20-1316100)

Dry weight……75kg

Cooling area……40m^2

Core material…….. Copper

Length of core……784 mm

Width of core……96 mm

Height of core……..740mm

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

Coolant resistance limit……15 kPa

Intercooler

Cooling area……20.84 m^2

Core material…….. Copper

Width of core……784mm

Height of core……740 mm

Air resistance limit……..10 kPa

Coolant pump

Rotation speed……2730 r/min

Drive mode.....Pulley driven

Fan

Diameter……630 mm

Drive ratio……..0.66:1

Material……..Steel

Number of blades……..6

Type……..Blowing

Intake system

Air filter

Max. intake resistance:

-Clean air filter ..... 3.5 kPa

-Dirty air filter .....5 kPa

-Warning of intake resistance ..... 6.2 kPa

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

Inclination

Transverse inclination/longitudinal inclination (volume of engine oil sump: 20 L) ..... .10°/ 10°

Fuel system

Injection system……..Mechanical pump+electronic governor

Injector

Type……..Mechanical

Injector opening pressure .....……(23~24) MPa

Fuel pump

Drive mode ..... Gear driven

Fuel delivery pump flow @1800 rpm 1.2L/min

Max. fuel inlet temperature limit.....57 ℃

Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure)..... .(35~150) kPa

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

Fuel filter

Rated flow ..... 1.2 L/min

Max. original resistance..... .≤7.5 kPa

Water separation efficiency at the rated flow ..... .≥95 %

Filter efficiency:

For particles of 10 μm..... ≥96 %

Fuel consumption

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

Load condition	1800 r/min	
	g/(kW·h)	L/h
Standby	220.3	40.6
Prime	215.0	36.0
75% prime	212.7	26.7
50% prime	221.0	18.5

Lubricating system

Total oil capacity(dry engine) ..... 17 L

Total oil capacity(oil change) 15L

Oil sump capacity - low level/high level ..... 15/17 L

Max. oil temperature (in oil sump) ..... 115 ℃

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

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

Oil pressure(rated speed)..... (250~600) kPa

Oil-fuel consumption ratio..... ＜0.1%

Oil filter

The filtering efficiency at the rated flow of 30 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 24V/14V

Output current 27A/90A

Starter

Type ..... Electric start, 1

Voltage 24V/12V

Power 6 kW/5.5kW

Number of teeth of flywheel..... 110

Number of teeth of starter..... 11

Cold start (test data, for reference only)

24 V				
Battery specification×quantity:12V/180Ah×2				
Starting temperature	℃	25	-15	-25
Starting speed	r/min	264	280	375
Starting current	A	213	441	722
Starting voltage	V	22.9	19.2	16.6
Starting time	s	2.3	9.2	22.5
Preheating time	s	0	0	30
12 V				
Battery specification×quantity:12V/180Ah×2(in parallel)				
Starting temperature	℃	25	-15	-25
Starting speed	r/min	203	129	89
Starting current	A	698	734	926
Starting voltage	V	9.7	8.6	6.6
Starting time	s	3.6	4.1	4.4
Preheating time	s	0	0	45

Auxiliary intake heater

Type..... Grating-type

Specification ..... 2.1 kW

Water preheater

Recommended specification. ..... 1.5 kW/220 V

Engine preheater water outlet interface (thermostat)... NPT 1/4

Engine preheater water inlet interface (distributor)..... NPT 3/8

Oil heater

Recommended specification. ..... 150 W/220 V

Interface (oil sump, 1)..... M22×1.5

Exhaust system

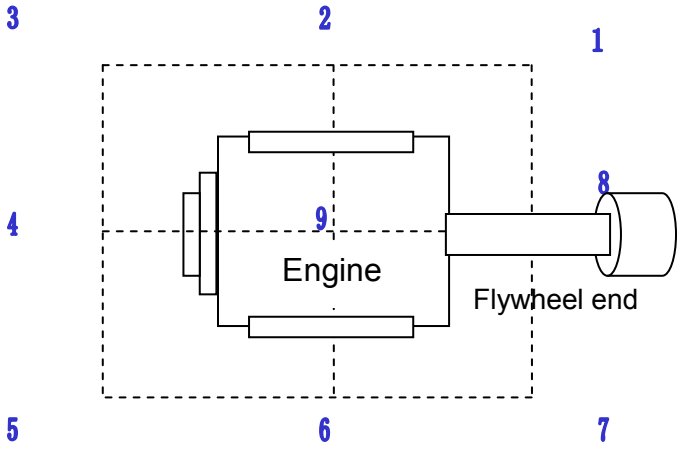
Max. exhaust backpressure..... 10 kPa

Inner diameter of exhaust port pipe..... Φ79 mm

Noise

Noise data (140 kW @ 1800 r/min)

Position	Noise Lp, dB(A)
1	90.0
2	95.7
3	92.3
4	100.3
5	93.1
6	99.4
7	91.5
8	88.2
9	94.5



Noise spectrum (140kW @ 1800 r/min)

Frequency, Hz	Noise, dB(A)
63	50.2
125	66.0
250	78.1
500	83.3
1k	90.2
2k	86.5
4k	83.5
8k	72.4
16K	68.6