

YC4A140-D30

Prime power: 95 kW @ 1500 r/min

Standby power: 105 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	4
Configuration	Vertical, in-line
Aspiration	Turbocharged, air-air intercooled
Combustion system	Direct injection
Compression ratio	17.5:1
Bore	108 mm
Stroke	132 mm
Displacement	4.84 L
Rotation	Counterclockwise (viewed from the flywheel end)
Firing order (viewed from the belt pulley end)	1-3-4-2
Dry weight (without radiator)	465 kg
Wet weight (without radiator)	550 kg

Overall dimensions

Length (from front end of radiator to rear end of air filter)	1446 mm
Width	745 mm
Height (with radiator and mounting support)	1087 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	420.6 mm
Height relative to the center of the crankshaft	146.9 mm

Centerline deviation relative to the crankshaft center gravity

.....-8 mm

Moments of rotation inertia

Engine	1.068 kg·m ²
Flywheel	0.89 kg·m ²

Performance rating

Speed droop	≤0.1 %
Steady state speed band	≤0.2 %

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	105	95
Net engine power	kW	99	90
Fan power consumption (belt pulley driven)	kW	4.8	4.8
Other power loss	kW	1.2	0.2
Mean effective pressure	MPa	1.74	1.57
Intake air flow	m ³ /min	6.8	6.6
Exhaust temperature limit (after turbocharger)	°C	550	550
Exhaust flow	m ³ /min	19.0	18.4
Boost pressure ratio		2.7	2.6
Thermal efficiency	%	36.7	36
Mean piston speed	m/s	6.6	6.6
Coolant flow	L/min	160	160
Cooling fan air flow	m ³ /min	184.2	184.2
Typical gen-set electrical output (power factor:0.8)	kW	88	80
	kVA	110	100
Assumed generator efficiency	%	88.9	88.9

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	268	243
Output power (gross)	kW	105	95
Output power (net)	kW	99	90
Fan power consumption	kW	4.8	4.8
Other power loss	kW	1.2	0.2
Heat dissipation capacity(coolant circulation)	kW	63	54
Heat dissipation capacity(intake intercooled system)	kW	17	17
Heat dissipation of exhaust	kW	80	75
Heat dissipation of thermal radiation	kW	3	2

Heat dissipating capacity of Yuchai engine with A9H60-1316100 radiator at an ambient temperature of 50°C is as follows:

Designation	Unit	Energy balance parameters	
		Standby	Prime
		50 Hz @ 1500 r/min	
Total fuel chemical energy	kW	277	252
Output power (gross)	kW	105	95
Output power (net)	kW	99	90
Fan power consumption	kW	4.8	4.8
Other power loss	kW	1.2	0.2
Heat dissipation capacity(coolant circulation)	kW	68	58
Heat dissipation capacity(intake intercooled system)	kW	18	18
Heat dissipation of exhaust	kW	82	78
Heat dissipation of thermal radiation	kW	4	3

Cooling system

Total coolant capacity.....	27 L
Engine coolant capacity.....	9 L
Radiator coolant capacity.....	15 L
Pipeline coolant capacity.....	3 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.....	(70±2)°C
full open.....	<80°C
Max. coolant temperature rise:	
-Standby power.....	8°C
-Prime power.....	7°C

Radiator

Cooling area.....	34.2m ²
Dry weight.....	70kg
Core material.....	Aluminum
Number of lines.....	60
Density of core.....	13 cooling fins/inch
Width of core.....	608 mm
Height of core.....	670 mm
Min. pressure of pressure cap.....	(50±5)kPa
Coolant resistance limit.....	15 kPa

Intercooler

Cooling area.....	18.5 m ²
Core material.....	Aluminum
Number of lines.....	41
Density of core.....	12 cooling fins/inch
Width of core.....	666 mm
Height of core.....	640 mm
Air resistance limit.....	10 kPa

Coolant pump

Rotation speed.....	3000 r/min
Drive mode.....	Pulley driven

Fan

Diameter.....	500 mm
Drive ratio.....	2:1
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
-Air filter type.....	Dry-type, filter cartridge of paper

Inclination

Transverse inclination/longitudinal inclination (volume of engine oil sump: 15 L)	20°/ 30°
Transverse inclination/longitudinal inclination (volume of engine oil sump: 10.5 L)	30°/ 40°

Fuel system

Injection system.....High pressure common rail

Injector

Type.....	Electronically controlled, with multiple jets
Injector opening pressure.....	Electronically controlled

Fuel pump

Drive mode	Gear driven
Fuel delivery pump flow @1500 rpm	3 L/min
Max. fuel inlet temperature limit.....	70 °C
Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure).....	(35~100) kPa
Maximum fuel return pressure of fuel pump	20 kPa

Fuel filter

Pre- filter

Rated flow.....	5 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.....	5 L/min
Max. original resistance.....	7 kPa
Filtering efficiency:	
For particles of 10 μm.....	99.8 %
For particles of 3 μm.....	97.5 %

Fuel consumption

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

Load condition	1500 r/min	
	g/(kW·h)	L/h
Standby	224.2	28.2
Prime	223.3	25.4
75% prime	237.0	20.2
50% prime	245.7	13.9

Lubricating system

- Total oil capacity(dry engine) 17 L
- Total oil capacity(oil change) 15 L
- Oil sump capacity - low level/high level 10.5/16 L
- Max. oil temperature (in oil sump)120 °C
- Operating oil temperature(in oil sump)..... (90~115) °C
- Oil pressure(idle speed) ≥120 kPa
- Oil pressure(rated speed)..... (250~500) kPa
- Oil-fuel consumption ratio <0.2 %

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/14V
Output current 55A/65A

Starter

Type Electric start, 1
Voltage 24V/12V
Power 5 kW/3.7kW
Number of teeth of flywheel..... 130
Number of teeth of starter..... 11

Cold start (test data, for reference only)

24 V					
Battery specification×quantity:12V/180Ah×2					
Starting temperature	°C	-15	-20	-25	-30
Starting speed	r/min	165	174	146	130
Starting current	A	278	368	417	465
Starting voltage	V	21.64	21.86	19.71	18.02
Starting time	s	3.5	5.5	3.0	5.5
Preheating time	s	0	0	50	60

12 V					
Battery specification×quantity:12V/110Ah×2(in parallel)					
Starting temperature	°C	-15	-20	-25	-30
Starting speed	r/min	143	131	122	/
Starting current	A	617	671	721	/
Starting voltage	V	10.3	9.39	9.36	/
Starting time	s	4.0	5.5	7.2	/
Preheating time	s	0	40	50	/

Auxiliary intake heater

Type..... Grating-type
Specification 2 kW

Water preheater

Recommended specification.2 kW/220 V
Engine preheater water outlet interface (thermostat).... NPT 1/2
Engine preheater water inlet interface (distributor)..... NPT 1/2

Oil heater

Recommended specification.90 W/220 V
Interface (oil sump, 1)..... M22×1.5

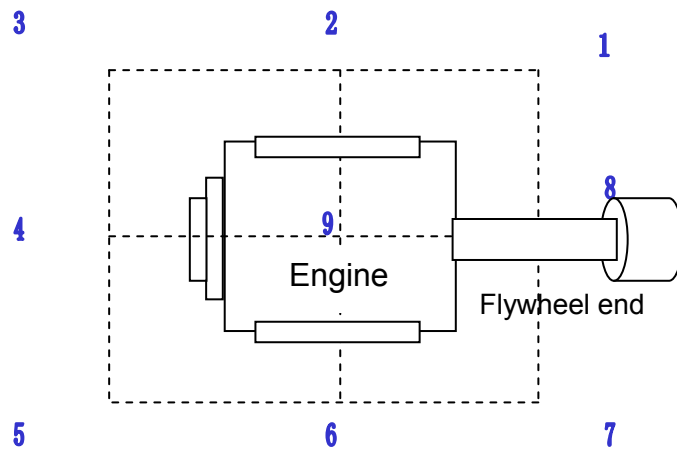
Exhaust system

Max. exhaust backpressure..... 10 kPa
Inner diameter of exhaust port pipe.....Φ60 mm

Noise

Noise data (95 kW @ 1500 r/min)

Position	Noise, dB(A)
1	86.1
2	92.3
3	90.0
4	95.1
5	90.7
6	90.8
7	86.3
8	89.0
9	88.7



Noise spectrum (95 kW @ 1500 r/min)

Frequency, Hz	Noise, dB(A)
63	54
125	59
250	77
500	76
1K	82
2K	78
4K	77
8K	69

