

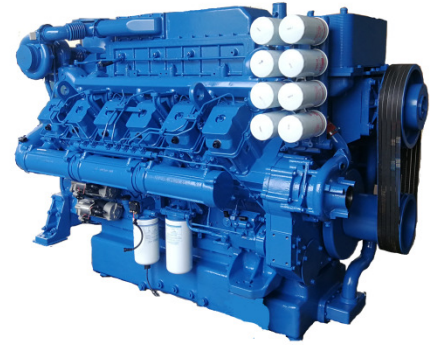
# List of Parameters of YC12VTD2000-D30 G-Drive Diesel Engine

Version: 2022V01 Implementation  
Mar. 1, 2022

## YC12VTD2000-D30

Prime power: 1,345 kW @ 1,500 r/min

Standby power: 1,480 kW @ 1,500 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 unlimited running hours 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 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 limited running hours up to 200h, 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 prime power.

### Main technical parameters

Number of cylinders .....	12
Configuration .....	V, 90°
Aspiration .....	Turbocharged, water-air intercooled
Combustion system .....	Direct injection
Compression ratio .....	14:1
Bore .....	152 mm
Stroke .....	180 mm
Displacement .....	39.2 L
Rotation ....	Counterclockwise (viewed from the flywheel end)
Firing order: A(1)-B(2)-A(5)-B(4)-A(3)-B(1)-A(6)-B(5)-A(2)-	
B(3)-A(4)-B(6) Viewed from the back end: numbered starting from 1, with A for left side, and B for right side.	
Dry weight (excluding radiator) .....	4,570 kg
Wet weight (excluding radiator) .....	4,850 kg

### Overall dimensions

Length (from the fan to the flywheel housing) .....	2,240 mm
Width .....	1,700 mm
Height .....	1,950mm

**Gravity center coordinate (dry engine, with the center of the end face of the flywheel shell as the origin)**

From the rear end face of the flywheel. ....	.867.1mm
Height relative to the center of the crankshaft .....	.224.5 mm
Centerline deviation relative to the crankshaft center gravity ..	-0.9mm

### Shafting rotation inertia

Engine .....	13.02 kg·m <sup>2</sup>
Flywheel .....	9.188 kg·m <sup>2</sup>

### Performance rating

Speed drop .....	0.3%
Speed fluctuation rate .....	0.5%
Speed governing type .....	Electronic control

### 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℃

Note: Unless otherwise specified, the data of this list of parameters are measured under these test conditions. If the engine is used under other test conditions other than those described above, proper adjustment shall be made according to the actual environment. For specific details, please contact Yuchai technical service department.

## Matching parameters

Designation	Unit	Matching parameters	
		Standby	Prime
		50 Hz @ 1500 r/min	
Gross engine power	kW	1480	1345
Net engine power	kW	1405	1270
Fan power consumption (belt pulley driven)	kW	73	73
Other power loss	kW	2	2
Mean effective pressure	MPa	3.02	2.74
Intake air flow	m <sup>3</sup> /min	87.5	80.8
Exhaust temperature limit (after turbocharger)	°C	550	500
Exhaust flow	m <sup>3</sup> /min	205.8	197.3
Boost pressure ratio		4.11	3.72
Thermal efficiency	%	38.5	40.0
Mean piston speed	m/s	9	9
Coolant flow (high temperature)	L/min	1225	1225
Coolant flow (low temperature)	L/min	720	720
Cooling fan air flow	m <sup>3</sup> /min	2430	2430
Typical gen-set electrical output (power factor:0.8)	kW	1300	1200
	kVA	1625	1500
Assumed generator efficiency	%	92.5	94.5

## 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	3845	3359
Output power (gross)	kW	1480	1345
Output power (net)	kW	1405	1270
Fan power consumption	kW	73	73
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	910	805
Heat dissipation capacity(intake intercooled system)	kW	380	335
Heat dissipation of exhaust	kW	958	800
Heat dissipation of thermal radiation	kW	117	74

When a TDV300-1301100-A81 radiator is used as a matching unit, the heat dissipations of Yuchai engine at an ambient temperature of 40°C are shown below: (softened water bench test data)

Designation	Unit	Energy balance parameters	
		Standby	Prime
		50 Hz @ 1500 r/min	
Total fuel chemical energy	kW	3910	3423
Output power (gross)	kW	1480	1345
Output power (net)	kW	1405	1270
Fan power consumption	kW	73	73
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	920	809
Heat dissipation capacity(intake intercooled system)	kW	387	340
Heat dissipation of exhaust	kW	1088	849
Heat dissipation of thermal radiation	kW	135	80

## Cooling system

Total coolant capacity .....	85 L
Engine coolant capacity.High temperature: 100 L, low temperature: 21 L	
Radiator coolant capacityHigh temperature: 172 L, low temperature: 152 L	
Pipeline coolant capacity .....	40 L
Max. water outlet temperature of engine (high temperature water passage).....	≤97°C
Max. outlet temperature of engine (low temperature water passage).....	≤70°C
Pressure difference between inlet and outlet of water pump (max. hydrostatic head).....	150 kPa
Thermostat operation temperature .....	
Initial opening temperature (75±2)°C, full opening temperature (85±2)°C	
Max. water temperature rise:	
- Standby power .....	9°C
- Prime power .....	8°C

### High temperature radiator

Cooling area .....	538 m <sup>2</sup>
Dry weight .....	860 kg
Material.....	Aluminum
Number of lines .....	/line
Density of core .....	cooling fins/inch
Width of core .....	2055 mm
Height of core .....	2166 mm
Min. pressure of pressure cover .....	(50±5) kPa
Resistance limit .....	25 kPa

### Low temperature radiator

Cooling area .....	538 m <sup>2</sup>
Material.....	Aluminum
Number of lines .....	.Line
Density of core .....	cooling fins/inch
Width of core .....	2055mm
Height of core .....	2166 mm
Resistance limit .....	15 kPa

### Water pump

Rotation speed. ....	2,813 r/in
Drive mode.....	Gear drive

### Fan

Diameter.....	1,700 mm
Gear ratio .....	1:0.73

Material .....	Nylon
Number of blades .....	10
Blowing/suction .....	Blowing type

## Intake system

### Air cleaner

Max. intake resistance:	
- Clean air cleaner .....	3.5 kPa
- Dirty air cleaner .....	5 kPa
- Air cleaner type .....	Dry paper element

### Inclination

Transverse inclination/longitudinal inclination (oil sump capacity: 160 L).....	5°/5°
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## Fuel system

Injection system.....	High pressure common rail
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### Fuel injector

Type .....	Mechanical control injector, multi-hole injection
Fuel injector opening pressure .....	Electronically-controlled

### Fuel pump

Drive mode.....	Gear drive
Fuel delivery pump flow @ 1,500 rpm .....	2×9 L/min
Max. fuel inlet temperature limit.....	70°C

Allowed fuel inlet pressure (absolute pressure) at the front end of fuel delivery pump .....	(50~100) kPa
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Max. fuel return pressure of fuel pump.....	30 kPa
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### Fuel filter

#### Primary filter

Rated flow .....	2×15 L/min
Max. original resistance.....	15 kPa
Water separation efficiency under rated flow.....	≥95%
Filtration efficiency:	
For particles of 25 μm.....	99%
For particles of 10 μm.....	85 %

#### Secondary filter

Rated flow .....	2×15 L/min
Max. original resistance.....	10 kPa
Filtration efficiency:	
For particles of 10 μm.....	99.6%
For particles of 3 μm.....	98.5%

## Fuel consumption

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

Conditions	1500 r/min	
	g/ (kW·h)	L/h
Standby power	218.7	387.6
Prime power	210.2	338.6
75% of prime power	207.8	251.0
50% of prime power	216.5	174.4

## Lubricating system

Total oil capacity (dry engine) ..... 215 L  
 Total oil capacity (oil change) ..... 210 L  
 Oil sump capacity - low level/high level ..... 160/210 L  
 Max. oil temperature (oil sump)..... 120°C  
 Operating oil temperature (oil sump)..... (90~115)°C  
 Oil pressure at idle speed..... ≥120 kPa  
 Oil pressure at rated speed ..... (250~500) kPa  
 Engine 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:

15 μm ≤ Particle size < 20 μm ..... > 75%;  
 20 μm ≤ Particle size < 30 μm ..... > 95 %;  
 30 μm ≤ Particle size < 40 μm ..... > 99 %;  
 Particle size ≥ 40 μm ..... > 99.9999%;

## Electric system

Type ..... Negative grounding

### Charging alternator 24 V

Voltage ..... 28 V  
 Output current ..... 55 A

### Starter (24 V/12 V)

Type ..... Electric start, 2

Voltage ..... 24 V  
 Power ..... 8.5 kW  
 Number of flywheel teeth ..... 141  
 Number of starter teeth ..... 10

## Cold start (test data, for reference only)

24V					
Battery specification × quantity 12 V/195 Ah×4					
Starting temperature	°C	0	-15	-30	-40
Starting speed	r/min	122	120	117	114
Starting current	A	/	/	/	/
Starting voltage	V	24.2	19.59	18.33	17.78
Starting time	s	1.9	2.21	2.49	3.32
Preheating time	s	0	Water heated to 40°C		

## Auxiliary intake heater

Type ..... N/A  
 Specification ..... N/A

## Water preheater

Recommended specification ..... 6 kW/220 V  
 Engine preheater water outlet interface ..... 2×NPT 1  
 Engine preheater water inlet interface ..... 2×Φ28

## Oil heater

Recommended specification ..... 300 W/220 V  
 Interface (oil sump, 2) ..... M22×1.5

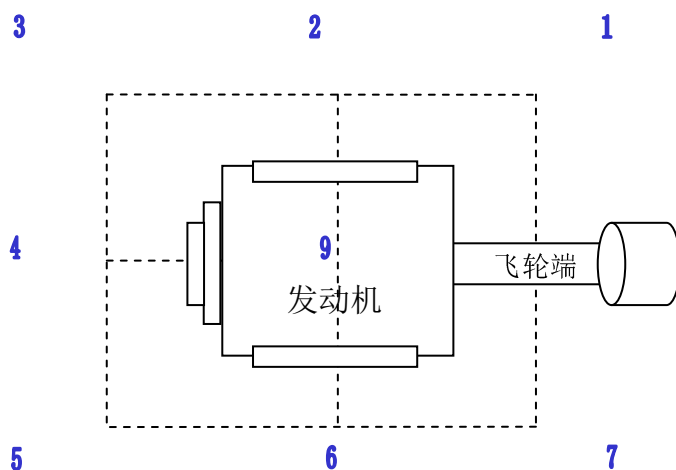
## Exhaust system

Max. exhaust backpressure ..... 10 kPa  
 Inner diameter of exhaust port ..... 250 mm

## Noise

### Noise data (1,345 kW @ 1,500 r/min)

Position	Sound pressure level Lp, dB(A)
1	103.3
2	105.2
3	101.6
4	105.0
5	102.6
6	105.1
7	102.8
8	107.8
9	105.9



### Noise spectrum (1,345 kW @ 1,500 r/min)

Frequency, Hz	Noise, dB(A)
63	56.3
125	70.5
250	79.2
500	86.5
1K	90.8
2K	89.1
4K	88.4
8K	99.8

