Version: 2024V01 Implemented on: Jan. 30, 2024

# YC16VC4200-D30

**Prime power: 2808 kW @ 1500 r/min**

**Standby power: 3089 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 ..... 16

Configuration ..... Vertical, V-type

Aspiration ..... Turbocharged, water-air intercooled

Combustion system ..... . Direct injection

Compression ratio ..... 13.5:1

Bore ..... . 200 mm

Stroke ..... . 210 mm

Displacement ..... . 105.56 L

Rotation……Counterclockwise (viewed from the flywheel end)

Firing order (viewed from the belt pulley end)…..... left 1—right 1-left 6—right 6-left 2—right 2-left 5—right 5-left 8—right 8-left 3-right 3-left 7-right 7-left 4-right 4

Dry weight (without radiator) ..... .12200 kg

Wet weight (without radiator) ..... . 13000 kg

## Overall dimensions

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

……3910 mm

Width ……1690 mm

Height (with radiator and mounting support)..... …....2450 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……1652 mm

Height relative to the center of the crankshaft……225 mm

Centerline deviation relative to the crankshaft center gravity

……44 mm

## Moments of rotation inertia

Engine ..... 44.42 kg·m$^2$

Flywheel ..... 29.36 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 ..... 35 %

Max. operating intake resistance ..... ≤3.7 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 | 3089 | 2808 |
| Net engine power | kW | 2931 | 2650 |
| Fan power consumption (belt pulley driven) | kW | 156 | 156 |
| Other power loss | kW | 2 | 2 |
| Mean effective pressure | MPa | 2.34 | 2.13 |
| Intake air flow | $m^3$ /min | 257 | 245 |
| Exhaust temperature limit (after turbocharger) | ℃ | ≤580 | ≤550 |
| Exhaust flow | $m^3$ /min | 635 | 608 |
| Boost pressure ratio | | 4.08 | 3.88 |
| Thermal efficiency | % | 39.5 | 40.5 |
| Mean piston speed | m/s | 10.5 | 10.5 |
| Coolant flow(high temperature) | L/min | 1800 | 1800 |
| Coolant flow(low temperature) | L/min | 2000 | 2000 |
| Cooling fan air flow | $m^3$ /min | 4200 | 4200 |
| Typical gen-set electrical output (power factor:0.8) | kW | 2800 | 2500 |
| | kVA | 3500 | 3125 |
| Assumed generator efficiency | % | 95.5 | 94.3 |

## 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 | 7777 | 7002 |
| Output power (gross) | kW | 3089 | 2808 |
| Output power (net) | kW | 2931 | 2650 |
| Fan power consumption | kW | 156 | 156 |
| Other power loss | kW | 2 | 2 |
| Heat dissipation capacity(coolant circulation) | kW | 1000 | 926 |
| Heat dissipation capacity(intake intercooled system) | kW | 1050 | 950 |
| Heat dissipation of exhaust | kW | 2450 | 2150 |
| Heat dissipation of thermal radiation | kW | 180 | 160 |
| Heat dissipation of fule | kW | 8 | 8 |

## Cooling system

Total coolant capacity……1030 L

Engine coolant capacity……450 L

Radiator coolant capacity……540 L

Pipeline coolant capacity……40 L

Engine max. outlet coolant temperature(high temperature). ≤98℃

Engine max. inlet coolant temperature(low temperature)…. ≤67℃

Pressure difference between inlet and outlet of water pump (max. hydrostatic head)……135.5/332 kPa

Thermostat operation temperature

Initial open…… (75±2)℃

full open…… ＜85℃

Max. coolant temperature rise(high temperature):

-Standby power……9.5℃

-Prime power……8.8℃

Max. coolant temperature rise(low temperature):

-Standby power……9.0℃

-Prime power……8.0℃

### Radiator

Cooling area(high temperature)……858$m^2$

Cooling area(low temperature)……929$m^2$

Dry weight……2200kg

Core material……Aluminum

Width of core……2800 mm

Height of core……2646 mm

Min. pressure of pressure cap…… (70±5)kPa

Coolant resistance limit……90 kPa

### Intercooler

Cooling area……227.5 $m^2$

Core material……T2,B10

Air resistance limit……20 kPa

### Coolant pump

Rotation speed……2700 r/min

Drive mode……gear driven

## Intake system

### Air filter

Max. intake resistance:

-Clean air filter …… 2.45 kPa

-Dirty air filter …… 6 kPa

-Air filter type……dry-type, filter cartridge of hardware cloth

## Inclination

Transverse inclination/longitudinal inclination (volume of engine oil sump: 400 L) …… 20°/15°

## Fuel system

Injection system……High pressure common rail

### Injector

Type……Electronically controlled, with multi

Injector opening pressure……Electronically conti

### 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)……(35～100) kPa

Maximum fuel return pressure of fuel pump ……20 kPa

### Fuel filter

**Pre- filter**

Rated flow…… 40 L/min

Max. original resistance …… 15kPa

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…… 60 L/min

Max. original resistance …… 10 kPa

Filtering efficiency:

For particles of 10 μm……99.6 %

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 | 212.1 | 784.6 |
| Prime | 206.3 | 693.8 |
| 75% prime | 201.4 | 508.0 |
| 50% prime | 205.9 | 346.2 |

## Lubricating system

Total oil capacity(dry engine) .....520 L

Total oil capacity(oil change) .....460 L

Oil sump capacity .....460 L

Max. oil temperature (in oil sump) .....110 ℃

Operating oil temperature(in oil sump)..... (70~110) ℃

Oil pressure(idle speed) ..... （200-500）kPa

Oil pressure(rated speed)..... (400~700) kPa

Oil-fuel consumption ratio.....＜0.25 %

### Oil filter

The filtering efficiency at the rated flow of 200 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

**Starter**

Type ..... .Electric start, 2

Voltage ..... 24V

Power ..... 2×11 kW

Number of teeth of flywheel.....199

Number of teeth of starter..... 11

**Charger**

Voltage ..... 27V

Electric current .....55 A

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

| 24 V | | | | | |
|---|---|---|---|---|---|
| Battery specification × quantity: 12V/210Ah×4<br>Attention: the minimum CCA of battery should not be less than 1200A when applied to the cold area or plateau. | | | | | |
| Starting temperature | ℃ | -15 | -20 | -25 | -30 |
| Starting speed | r/min | / | / | / | / |
| Starting current | A | / | / | / | / |
| Starting voltage | V | / | / | / | / |
| Starting time | s | / | / | / | / |
| Preheating time | s | / | / | / | / |

**Water preheater**

Recommended specification. .....25 kW/380 V

Engine preheater water outlet interface..... . NPT1/2×2

Engine preheater water inlet interface..... . NPT1×2

**Oil heater**

Recommended specification. .....2.22kW/220 V

Interface (oil sump, 4)..... . M22×1.5

## Exhaust system

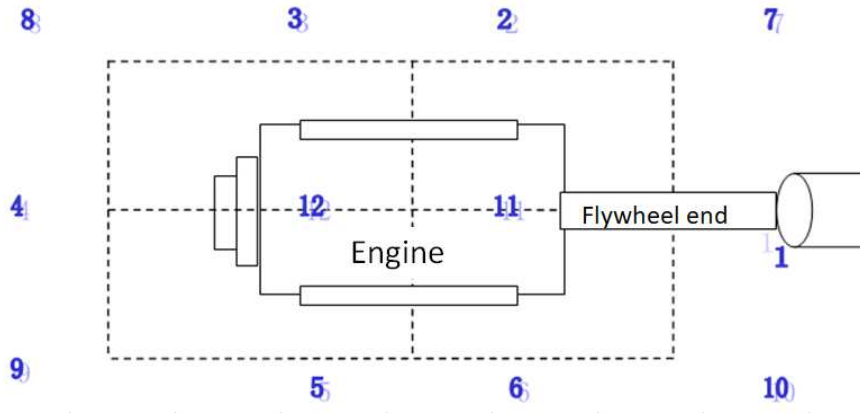
Max. exhaust backpressure..... 10 kPa

Inner diameter of single exhaust port pipe.....≥Φ300 mm

## Noise

### Noise data (2808 kW @ 1500 r/min)

| Position | Noise, dB(A) |
|---|---|
| 1 | 110.2 |
| 2 | 113.2 |
| 3 | 111.6 |
| 4 | 107.9 |
| 5 | 108.2 |
| 6 | 110.4 |
| 7 | 110.7 |
| 8 | 108.2 |
| 9 | 107.2 |
| 10 | 109.6 |
| 11 | 109.9 |
| 12 | 108.1 |




### Noise spectrum (2808 kW @ 1500 r/min)

| Frequency, Hz | Noise, dB(A) |
|---|---|
| 63 | 53.9 |
| 125 | 71.9 |
| 250 | 88.3 |
| 500 | 89.2 |
| 1K | 95.7 |
| 2K | 94.1 |
| 4K | 94.3 |
| 8K | 103.7 |
| 16K | 88.3 |

