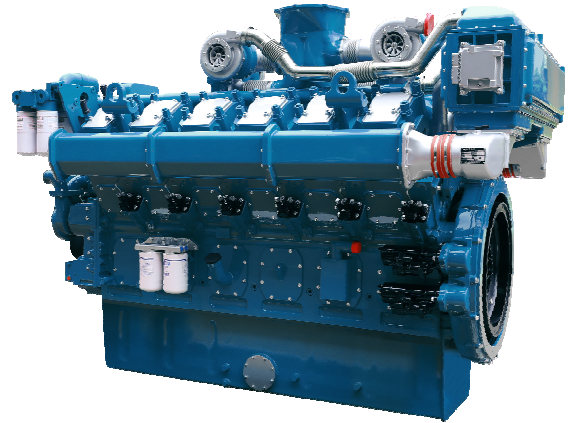


# YC12VC2070-D31

Prime power: 1380 kW @ 1500 r/min

Standby power: 1520 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 .....   | 12  |
| 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 .....  | 79.17 L   |
| Rotation .....  | Counterclockwise (viewed from the flywheel end) |
| Firing order .....  | B1-A6-B5-A2-B3-A4-B6-A1-B2-A5-B4-A3             |
| Viewed from the back end: numbered starting from 1, with A for left side, and B for right side. |   |
| Dry weight (without radiator) .....   | 8380 kg   |
| Wet weight (without radiator) .....   | 8810 kg   |

## Overall dimensions

|  |         |
|--|---------|
| Length (from front end of radiator to rear end of intercooler) ..... | 3120 mm |
| Width .....  | 1735 mm |
| Height .....   | 2400 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.....1127 mm

|  |        |
|--|--------|
| Height relative to the center of the crankshaft.....                 | 148 mm |
| Centerline deviation relative to the crankshaft center gravity ..... | -31 mm |

## Moments of rotation inertia

|                |                          |
|----------------|--------------------------|
| Engine .....   | 44.119 kg·m <sup>2</sup> |
| Flywheel ..... | 25.045 kg·m <sup>2</sup> |

## Performance rating

|                               |        |
|-------------------------------|--------|
| Speed droop .....             | ≤0.5 % |
| Steady state speed band ..... | ≤0.5 % |

## 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                  | 1520                | 1380   |
| Net engine power                                     | kW                  | 1463                | 1323   |
| Fan power consumption (belt pulley driven)           | kW                  | 56                  | 56     |
| Other power loss                                     | kW                  | 1                   | 1      |
| Mean effective pressure                              | MPa                 | 1.54                | 1.39   |
| Intake air flow                                      | m <sup>3</sup> /min | 154.18              | 143.08 |
| Exhaust temperature limit (after turbocharger)       | °C                  | 550                 | 550    |
| Exhaust flow   | m <sup>3</sup> /min | 330.34              | 305.12 |
| Boost pressure ratio                                 |                     | 2.91                | 2.67   |
| Thermal efficiency                                   | %                   | 41.0                | 41.0   |
| Mean piston speed                                    | m/s                 | 10.5                | 10.5   |
| Coolant flow (High-temperature)                      | L/min               | 1050                | 1050   |
| Coolant flow (Low-temperature)                       | L/min               | 900                 | 900    |
| Cooling fan air flow                                 | m <sup>3</sup> /min | 2520                | 2520   |
| Typical gen-set electrical output (power factor:0.8) | kW                  | 1350                | 1200   |
|  | kVA                 | 1688                | 1500   |
| Assumed generator efficiency                         | %                   | 92.7                | 90.7   |

### Thermal balance parameters

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

| Designation  | Unit | Thermal balance parameters |       |
|--|------|----------------------------|-------|
|  |      | Standby                    | Prime |
|  |      | 50 Hz @ 1500 r/min         |       |
| Total fuel chemical energy                               | kW   | 3709                       | 3366  |
| Output power (gross)                                     | kW   | 1520                       | 1380  |
| Output power (net)                                       | kW   | 1463                       | 1323  |
| Fan power consumption                                    | kW   | 56                         | 56    |
| Other power loss   | kW   | 1                          | 1     |
| Heat dissipation capacity(High-temp coolant circulation) | kW   | 385                        | 335   |
| Heat dissipation capacity(Low-temp coolant circulation)  | kW   | 669                        | 585   |
| Heat dissipation of exhaust                              | kW   | 972                        | 907   |
| Heat dissipation of thermal radiation                    | kW   | 163                        | 159   |

**Cooling system**

|  |         |
|--|---------|
| Total coolant capacity.....  | 608 L   |
| Engine coolant capacity (High-temp).....   | 160 L   |
| Engine coolant capacity(Low-temp).....   | 70 L    |
| Radiator coolant capacity (High-temp).....   | 146 L   |
| Radiator coolant capacity (Low-temp).....  | 172 L   |
| Pipeline coolant capacity.....   | 60 L    |
| Engine max. outlet coolant temperature(High-temp).....                                     | 95℃     |
| Engine max. inlet coolant temperature(Low-temp).....                                       | 65℃     |
| Pressure difference between inlet and outlet of water pump<br>(max. hydrostatic head)..... | 280kPa  |
| Thermostat operation temperature   |         |
| Initial open.....  | (75±2)℃ |
| full open.....   | (85±2)℃ |
| Max. coolant temperature rise (High-temp):   |         |
| -Standby power.....  | 8℃      |
| -Prime power.....  | 7℃      |
| Max. coolant temperature rise (Low-temp):  |         |
| -Standby power.....  | 9.6℃    |
| -Prime power.....  | 8.4℃    |

**Radiator**

|                                     |                      |
|-------------------------------------|----------------------|
| Cooling area(high temperature)..... | 378m <sup>2</sup>    |
| Cooling area(low temperature).....  | 652m <sup>2</sup>    |
| Dry weight.....                     | 1482kg               |
| Core material.....                  | Cuprum               |
| Number of lines.....                | 244                  |
| Density of core.....                | 12 cooling fins/inch |
| Width of core.....                  | 2559 mm              |
| Height of core.....                 | 2086 mm              |
| Min. pressure of pressure cap.....  | 50kPa                |
| Coolant resistance limit.....       | 30 kPa               |

**Intercooler**

|                           |                    |
|---------------------------|--------------------|
| Cooling area.....         | 99.8m <sup>2</sup> |
| Core material.....        | aluminium          |
| Number of lines.....      | 16                 |
| Density of core.....      | 1 of 1.2mm         |
| Width of core.....        | 1200 mm            |
| Height of core.....       | 360 mm             |
| Air resistance limit..... | 20 kPa             |

**Coolant pump**

|                     |             |
|---------------------|-------------|
| Rotation speed..... | 2864 r/min  |
| Drive mode.....     | gear driven |

**Fan (For reference. The engine has no fan)**

|                       |         |
|-----------------------|---------|
| Diameter.....         | 1700 mm |
| Drive ratio.....      | 1.26:1  |
| Material.....         | PAG     |
| Number of blades..... | 8       |
| Type.....             | Blowing |

**Intake system**

**Air filter**

|                         |  |
|-------------------------|--|
| Max. intake resistance: |  |
| -Clean air filter ..... | 3 kPa                                      |
| -Dirty air filter ..... | 6 kPa                                      |
| -Air filter type.....   | filter cartridge of steel wire & nonwovens |

**Inclination**

|  |          |
|--|----------|
| Transverse inclination/longitudinal inclination (volume of engine oil sump: 310 L) ..... | 15°/ 15° |
|--|----------|

**Fuel system**

|                       |                      |
|-----------------------|----------------------|
| Injection system..... | Electronic unit pump |
|-----------------------|----------------------|

**Injector**

|                                 |                                |
|---------------------------------|--------------------------------|
| Type.....                       | Mechanical, with multiple jets |
| Injector opening pressure ..... | 26~27 MPa                      |

**Fuel pump**

|  |             |
|--|-------------|
| Drive mode .....   | Gear driven |
| Fuel delivery pump flow @1500 rpm .....  | 38 L/min    |
| Max. fuel inlet temperature limit.....   | 50 ℃        |
| Allowed fuel inlet pressure of front end of fuel delivery pump<br>(absolute pressure)..... | 50 kPa      |
| Maximum fuel return pressure of fuel pump .....  | 25 kPa      |

**Fuel filter**

**Pre- filter**

|   |          |
|---|----------|
| Rated flow.....                                     | 40 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.....                | 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 | 1500 r/min |       |
|----------------|------------|-------|
|                | g/(kW·h)   | L/h   |
| Standby        | 205.4      | 373.9 |
| Prime          | 205.3      | 339.2 |
| 75% prime      | 215.1      | 266.6 |
| 50% prime      | 225.5      | 186.9 |

### Lubricating system

Total oil capacity(dry engine) .....370 L  
 Total oil capacity(oil change) .....310 L  
 Oil sump capacity - low level/high level .....220/315 L  
 Max. oil temperature (in oil sump) .....110 °C  
 Operating oil temperature(in oil sump)..... (85~105) °C  
 Oil pressure(idle speed) .....≥250 kPa  
 Oil pressure(rated speed)..... (350~800) kPa  
 Oil-fuel consumption ratio..... <0.3 %

### Oil filter

The filtering efficiency at the rated flow of 833 L/min and the assembly initial resistance ≤20 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 ..... 55A

### Starter

Type .....Electric start, 2  
 Voltage ..... 24V  
 Power ..... 11 kW  
 Number of teeth of flywheel.....199  
 Number of teeth of starter..... 11

### 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   | °C    | -15 | -20 | -25 | -30 |
| Starting speed   | r/min | /   | /   | /   | /   |
| Starting current   | A     | /   | /   | /   | /   |
| Starting voltage   | V     | /   | /   | /   | /   |
| Starting time  | s     | /   | /   | /   | /   |
| Preheating time  | s     | /   | /   | /   | /   |

### Auxiliary intake heater

Type...../  
 Specification...../

### Water preheater

Recommended specification. .... 2×kW/220 V  
 Engine preheater water outlet interface..... 2×Φ20  
 Engine preheater water inlet interface..... 2×Φ20

### Oil heater

Recommended specification. .... 800W/220 V  
 Interface (oil sump, 1)..... M22×1.5

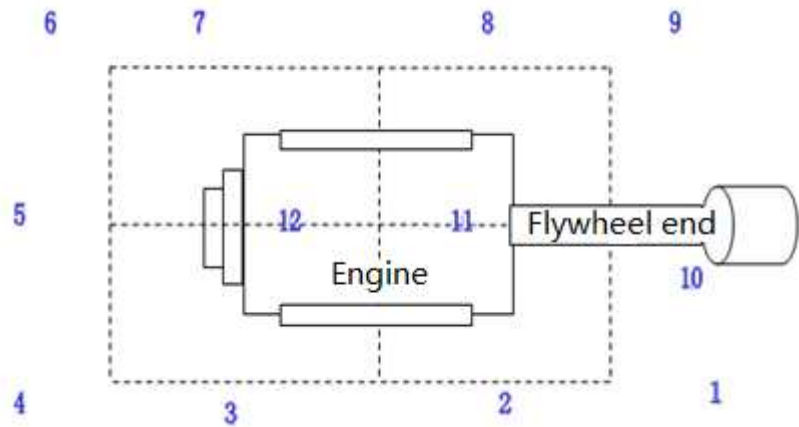
### Exhaust system

Max. exhaust backpressure..... 10 kPa  
 Inner diameter of exhaust port pipe..... φ 370 mm

## Noise

### Noise data (1380 kW @ 1500 r/min)

| Position | Noise, dB(A) |
|----------|--------------|
| 1        | 102.6        |
| 2        | 104.8        |
| 3        | 103.4        |
| 4        | 99.0         |
| 5        | 104.1        |
| 6        | 101.2        |
| 7        | 103.0        |
| 8        | 105.2        |
| 9        | 103.8        |
| 10       | 107.0        |
| 11       | 106.0        |
| 12       | 107.5        |



### Noise spectrum (1380 kW @ 1500 r/min)

| Frequency, Hz | Noise, dB(A) |
|---------------|--------------|
| 63            | 55.5         |
| 125           | 81.1         |
| 250           | 82.5         |
| 500           | 90.2         |
| 1K            | 91.2         |
| 2K            | 91.5         |
| 4K            | 90.1         |
| 8K            | 91.3         |
| 16K           | 77.5         |

