# GensetModel:PC45

PowerWorld® Diesel Generator

# POWERBYCUMMINS

110V-440V 3P4W

## Standard Features and Characteristics

● **QUALITY STANDARDS**

- ○ The POWERWORLDgenerator set compliance with all main standards, such as ISO8528 (GB/T2820-97), GB755, BS5000, VDE0530, ISO3046, IEC34-1, CSA22-2, AS1359, ISO14001.
- ○ Diesel engine and alternatorfromtheexclusivemanufacturerinchina and their quality assurance.
- ○ Other standards and certifications can be considered on request.

● **ASSEMBLY**

- ○ The engine and alternator are close coupled by means of an SAE flange . A full torsional analysis has been carried out to guarantee no harmful vibration will occur。
- ○ Anti-vibration pads are affixed between engine alternator feet and the base frame. Thus ensuring complete vibration isolation of the rotating assemblies and enabling the machine to be placed on an uneven surface without any detrimental effects.
- ○ For durability and corrosion resistance, all iron and steel surfaces of canopy fabrications have been treated for coating by grit blast cleaning. Then covered by special three layers painting which provides an excellent corrosion resistant surface.

● **CONTROL SYSTEM AND PROTECTION**

- ○ Controllers are available for all applications. The controller system is used to start and stop the engine , indicate electric date and protect the generator set. See controller features inside.
- ○ The revolving parts are covered by safety net , and the place which easy to scald and got an electric shock all to have been put on obvious warning slogan

● **WARRANTY**

- ○ Each POWERWORLD generating set has been got through 2 hours load test for running 0%,25%,50%,75%,100% and 110% load, all protective devices and control function are simulated and checked before despatch.
- ○ POWERWORLD Company provides one-source responsibility for the generator set and accessories.
- ○ Engine and Alternator are guaranteed for a period of 12months from the date of commissioning or 18 months from shipping, whichever occurs first.
- ○ Convenience for operation and maintenance, backed by CUMMINS and STAMFORD global service

## Rating Range

| | | RPM1500 50Hz |
|---|---|---|
| **Standby:** | kW | 34 |
| | kVA | 43 |
| **Prime:** | kW | 38 |
| | kVA | 48 |

### GENERATOR SET RATINGS

| Alternator Model | STAMFORD | | | | Marathon | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency and Speed | 50Hz 1500rpm | | | | 50Hz 1500rpm | | | |
| **Prime Power Data** | | | | | | | | |
| Class-TEMP Rise(℃) | Cont.H -125K/40℃ | | | | Cont.H -125K/40℃ | | | |
| Voltage series star | 380 | 400 | 415 | 440 | 380 | 400 | 415 | 440 |
| Voltage parallel star | 190 | 200 | 208 | 220 | 190 | 200 | 208 | 220 |
| Voltage series delta | 220 | 230 | 240 | 254 | 220 | 230 | 240 | 254 |
| Rating capacity(kVA) | 40.0 | 42.5 | 40.0 | 35.0 | 45.0 | 45.0 | 45.0 | 45.0 |
| Rating power(kW) | 32.0 | 34.0 | 32.0 | 28.0 | 36.0 | 36.0 | 36.0 | 36.0 |
| Power efficiency(%) | 86.7 | 86.6 | 87.3 | 87.6 | 88.5 | 88.5 | 88.5 | 88.5 |
| Input power(kW) | 36.9 | 39.3 | 36.7 | 36.5 | 40.7 | 40.7 | 40.7 | 40.7 |

**Standby Power Data**

| Class-TEMP Rise(℃) | Standby.H -150K/40℃ | | | | Standby.H -150K/40℃ | | | |
|---|---|---|---|---|---|---|---|---|
| Voltage series star | 380 | 400 | 415 | 440 | 380 | 400 | 415 | 440 |
| Voltage parallel star | 190 | 200 | 208 | 220 | 190 | 200 | 208 | 220 |
| Voltage series delta | 220 | 230 | 240 | 254 | 220 | 230 | 240 | 254 |
| Rating capacity(kVA) | 41.5 | 44.0 | 41.5 | 36.3 | 49.0 | 49.0 | 49.0 | 49.0 |
| Rating power(kW) | 33.2 | 35.2 | 33.2 | 29.0 | 39.0 | 39.0 | 39.0 | 39.0 |
| Power efficiency(%) | 86.4 | 86.3 | 87.1 | 88.1 | 87.8 | 87.8 | 87.8 | 87.8 |
| Input power(kW) | 38.4 | 40.8 | 38.1 | 33.0 | 44.5 | 44.5 | 44.5 | 44.5 |

**RATINGS:** All three-phase units are rated at 0.8 power factor. **Standby ratings :** Standby ratings apply to installations served by a reliable utility source. The standby rating is for this rating. Ratings are in according with ISO-3046/1,BS 5514 ,AS 2789 , and DIN 6271. **Prime Power Ratings:** Prime power ratings apply to installations where utility power is unavailable or unreliable. At varying load, the number of generator set operating hours is unlimited. A 10% overload capacity is available for one hour in twelve. Ratings are in accordance with IS0-8528/1, overload capacity in accordance with ISO-3046/1,BS 5514, AS 2789, and DIN 6271. For limited running time and base load ratings, consult the factory. The generator set manufacturer reserves the right to change the design or specifications without notice and without any obligation or liability whatsoever. **GENERAL GUIDELINES FOR DERATION: Altitude:** Derate 2.0% per 300m(984 ft.) elevation above 1000m(3279 ft.) up to a maximum elevation of 2450m(8000 ft.).More than 2450m(8000ft), please contacts with us or our dealer seek the help. **Temperature:** Derate 6.0% per 11 ℃ (20℉ ) temperature above 40℃ (104℉ ).

# ALTERNATOR

| Specification | 1500RPM 50HZ |
|---|---|
| Type | 4-Pole, Rotating Field |
| Exciter type | Brushless, Self excited |
| Voltage regulator(MX341) | Solid State, Volts/Hz |
| Voltage regulation | ≤1.5% |
| Insulation | Class H |
| Protection | IP23 |
| Rated power factor | 0.8 |
| Stator winding | Double layer concentric |
| Winding pitch | Two thirds |
| Winding leads | 12 |
| Maximum overspeed | 2250 Rev/min |
| Sustained short circuit | Self excited machines do not sustain a short circuit current |
| Waveform distortion | No load < 1.5%<br>Non-distorting balanced linear load < 5.0% |
| Altitude | ≤1000 m |

- Alternators meet the requirement of BS EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSAC22.2-100, As1359, and other standards and certifications can be considered on request.
- The 2/3 pitch design avoids excessive neutral currents. With the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.
- Brushless alternator with brushless pilot exciter for excellent load response.
- The insulation system is class H, easy parallelling with mains or other generators, standard 2/3 pitch stator windings avoid excessive neutral currents.
- Backed by worldwide service network

# DIESEL ENGINE

- 4BTA3.9-G2 diesel engines are manufactured by Cummins Engine Company, Inc.

## Application Data

| EngineSpecifications | 1500RPM 50HZ |
|---|---|
| Manufacturer | CUMMINS |
| Number of cylinders | 4 |
| Cylinder arrangement | In line |
| Cycle | Four stroke |
| Aspiration | Turbocharged,Aftercooled |
| Compression ratio | 16.5:1 |
| Bore | 102 mm (4.02 in) |
| Stroke | 120 mm (4.72 in) |
| Displacement | 3.9 litres |
| Direction of rotation | Clockwise viewed from front |
| Max.Power at rated rpm | 73kW |
| Estimated total weight(dry) | 350 kg (770 lb) |
| Frequency regulation steady state | ±0.5% |
| Frequency | Fixed |
| Idel speed | 950-1150 |
| Mean piston speed | 6.0m/s |

## Exhaust

| Exhaust System | 1500RPM 50HZ |
|---|---|
| Maximum back pressure | 10.13 kPa |
| Exhaust gas flow (max) | 155 litre |
| Exhaust gas temperature (max) | 485℃(905°F) |

## Lubrication

| Lubrication system | 1500RPM 50HZ |
|---|---|
| Oil Pressure | |
| At idle speed | 207kPa |
| At governed speed | 345kPa |
| Maximum Oil Temperature | 121℃(250°F) |
| Total System Capacity (Including Bypass Filter) | 10.9 litre( 2.88US gal) |

## Engine Electrical

| Engine Electrical System | 1500RPM 50HZ |
|---|---|
| Battery charging alternator: | |
| Ground(negative/positive) | Negative |
| Volts(DC) | 24V |
| Ampere rating(DC) | 40A |
| Starter motor rated voltage(DC) | 24V |
| Battery voltage | 12V |
| Maximum Allowable Resistance of Cranking Circuit | 0.002 ohm |
| Minimum Recommended Battery Capacity: Cold Soak @ 10°F(-12°C) and Above | 312CCA |

## Fuel

| Fuel System | 1500RPM 50HZ |
|---|---|
| Type of injection | NYC A pump with GAC governor |
| Maximum Inlet Restriction at Lift Pump | 13.6kPa |
| Max. overflow fuel resistance at overflow pipe of injector | 67.8kPa |
| Total fuel overflow amount | 30 liter/h |
| Governor type | Electronic |

| Fuel consumption | 1500RPM 50HZ |
|---|---|
| Standby power | 10.3 litre/hr (2.7 US gals/hr ) |
| 100% prime power | 9.3 litre/hr (2.5 US gals/hr ) |
| 75% prime power | 7.3 litre/hr (1.9 US gals/hr ) |
| 50% prime power | 5.3 litre/hr (1.4 US gals/hr ) |
| 25% prime power | 3.4 litre/hr (0.9 US gals/hr ) |
| Continuous power | N/A litre/hr (32.1 US gals/hr ) |

# Application Data

## Cooling System

| Cooling System | 1500RPM 50HZ |
|---|---|
| Total system capacity | |
| Engine Only | 7.9 litres |
| Radiator | 16.9 litres |
| Fan gas flow | 6790m³/hr |
| Thermostat operation range | 82 - 95℃ (180 - 203 °F) |
| Maximum water temperature | 100 ℃ (212°F) |
| Minimum Pressure Cap | 69kPa |
| Maximum Top Tank Temperature | |
| for Standby Power | 104 ℃ (220°F) |
| for Prime Power | 100 ℃ (212°F) |

NOTE:

All data is based on:

1. Engine operating with fuel system, water pump, lubricating oil pump, air cleaner and exhaust silencer; not included are battery charging alternator, fan, and optional driven components.
2. Engine operating with fuel corresponding to grade No. 2-D per ASTM D975.
3. ISO 3046, Part 1, Standard Reference Conditions of:
   Barometric Pressure : 100 kPa (29.53 in Hg)
   Air Temperature : 25 ℃ (77°F)
   Altitude : 110 m (361 ft)
   Relative Humidity : 30%
   Air Intake Restriction : 254 mm H2O (10 in H2O)
   Exhaust Restriction : 51 mm Hg (2 in Hg)

TBA: To Be Determined

# CONTROLLERS

## GTR-168 MANUAL CONTROLLER


The Model GTR-168 is a Manual Engine Control Module designed to control the engine via a key switch and pushbuttons on the front panel. The module is used to start and stop the engine and indicate fault conditions, automatically shutting down the engine and indicating the engine failure by LED, giving true, first up fault annunciation.

**Panel introduction:**

- Indicator type frequency, voltmeter and ampere meter demonstration unit's electrical parameter.
- The voltage change-over switch and the rheotrope uses for to choose the different phase voltage and current to display.
- The big red button uses for the operator to stop the genset peremptorily
- The oil pressure gauge, coolant temperature gauge and the battery voltage gauge.
- The controller. And an integral anti-tamper LCD hours run counter is also provided.
- If the customer needs to use the preheating function, we will be able to increase the preheating button.

**Protection:**

Low Oil Pressure
High Engine Temperature
Auxiliary Shutdown
Over speed

**DC Supply:** 8 to 35 V Continuous.

## PLC5110 CONTROLLER

**Panel introduction:**

- Indicator type frequency, voltmeter and ampere meter demonstration unit's electrical parameter.
- The voltage change-over switch and the rheotrope uses for to choose the different phase voltage and current to display.
- The oil pressure gauge, coolant temperature gauge and the battery voltage gauge.
- The controller.
- Preheating button.

**Protection:**

Over Speed Shutdown.
Low Oil Pressure Shutdown.
High Engine Temp Shutdown.
Charger failure alarm.
Mains failure alarm.
Optional Under speed Protection.

**DC Supply:** 8 to 35 V Continuous.

## PLC5220 INTELIGENT CONTROL SYSTEM

The AMF25 is an Automatic Mains Failure module with generator monitoring, protection and start facilities. The controller has a large LCD screen, display the generator's each parameter, running and alarm information. The off/replacement button, mode switch button , start/stop button and the LED indicator light, makes the user easy to operate and maintain the generator.

**Panel introduction:**

- Indicator or digital type frequency, voltmeter and ampere meter demonstration unit's electrical parameter.
- The big red button uses for the operator to stop the genset peremptorily
- The controller.

**Function:**

- Communication: RS232 connection, uses the industry rank MODBUS protocol can easily communicate with others intelligence control system.
- Display function: LCD screen can display the generator's parameter and the control system's running information.
- Set up parameter: Engineer can set up the controller parameter from the control panel or through the PC, 6 programmable fan-out may satisfy the user each kind of demand.
- Protection: The control system can protect the generator set , manage each kind of electrical failure.
- Control Function of ATS.

**DC Supply:** 8 to 35 V Continuous.

# Standard Features and Accessories

### Paralleling System

- ☐ Reactive Droop Compensator
- ☐ Voltage Adjust Control
- ☐ Voltage Regulator Relocation Kit

### Controller System

- ☐ Common Failure Relay Kit
- ☐ Customer Connection Kit(Except Open Style)
- ☐ Communications Products and PC Software
- ☐ Engine Pre-alarm Sender Kit
- ☐ Remote Annunciator Panel
- ☐ Remote Audiovisual Alarm Panel
- ☐ Remote Emergency Stop Kit
- ☐ PCRC series control system, with RS232 or RS485 communication connection and communication agreement.

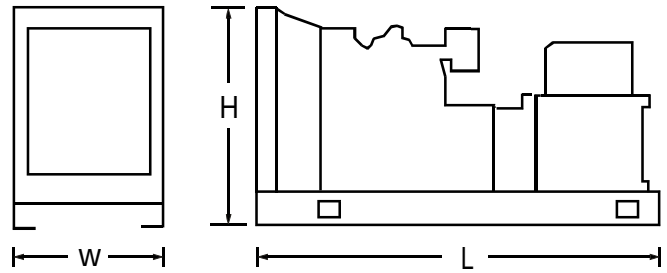
### Miscellaneous Accessories

- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____
- ☐ _____

## Dimensions and Weights

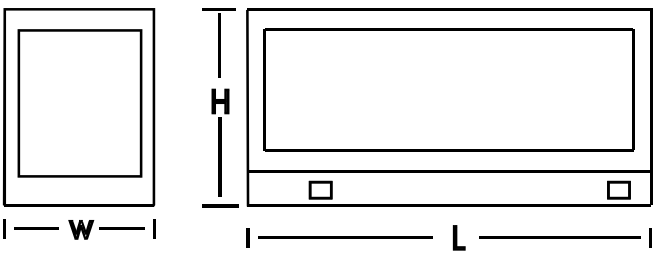
### Open Style

| | |
|---|---|
| Overall Size, L×W×H，mm | 1850x850x1100 |
| Weight(radiator model),net,Kg | 1000Kg |




### Soundproof Style

| | |
|---|---|
| Overall Size, L×W×H，mm | 2500x1100x1700 |
| Weight(radiator model),net,Kg | 1100Kg |




NOTE: This drawing is provided for reference only and should not be used for planning installation. Contact your local distributor for more detailed information.

DISTRIBUTED BY:

## Standard Features

- Battery, Battery Rack and Battery Cables
- Integral Vibration Isolation
- Oil Drain Extension
- Air cleaner ,Heavy Duty
- 3 Pole Circuit Breaker
- Heavy duty industrial type exhaust silencer with flexible pipe(supplied loose).

### Maintenance and Literature

- General Maintenance Literature Kit
- Test Certificate and design paper
- Quality certificate and Maintenance card

## Accessories

### Enclosed Unit

- ☐ Sound Enclosure
- ☐ Weather Enclosure (with enclosed critical silencer)
- ☐ Weather Housing (with roof-mounted critical silencer)
- ☐ Trailer(Causes the genset easily to move)

### Open Unit

- ☐ Exhaust Silencer, Critical kit
- ☐ Flexible Exhaust Connector, Stainless Steel

### Cooling System

- ☐ Block Heater (recommended for ambient temperatures below 0°C)
- ☐ Radiator Duct Flange
- ☐ Remote Radiator Cooling

### Fuel System

- ☐ Auxiliary Fuel Pump
- ☐ Flexible Fuel Lines
- ☐ Mechanical dipstick or fuel level sensor
- ☐ Subbase Fuel Tank with Day Tank
- ☐ Fuel fill cap with breather
- ☐ 10 hours running tank
- ☐ Automatic fuel--providing device
- ☐ Hand primer pump

### Electrical System

- ☐ Battery Charger, Equalize/Float Type

### Engine and Alternator

- ☐ 3 or 4 Pole Circuit Breaker with Shunt Trip
- ☐ Fuel/Water Separator
- ☐ Oil Preheater
- ☐ Air Preheater
- ☐ Alternator Strip Heater

### Maintenance and Literature

- ☐ Maintenance Kit (includes air, oil, and fuel filters)
- ☐ Overhaul Literature Kit