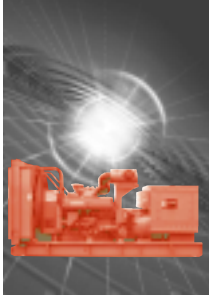
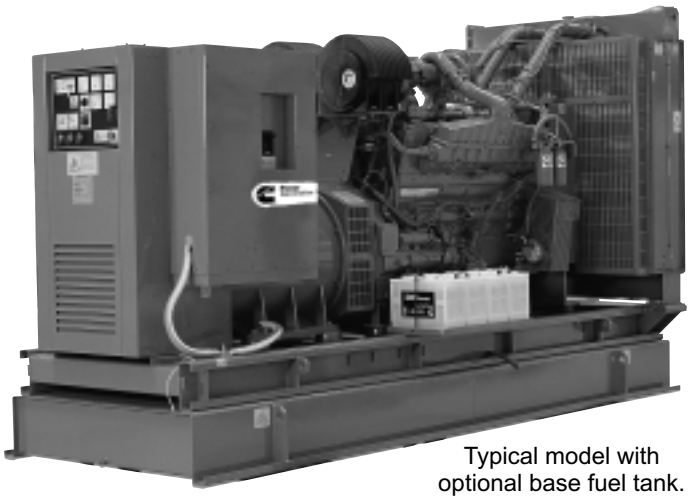


Power Generation

Diesel Powered Generating Sets 600 kW - 660 kW 50 Hz VTA28G6 Series Engine



Typical model with optional base fuel tank.

Standard Genset Features

Single Source Responsibility
- Design, manufacturer and test of all components and accessories are made by Cummins Power Generation and Cummins companies

International Integrity
- Assurance and strength of a worldwide, world class corporation

Global Backing
- 24 hour spares and service support – in 72 countries

Single Source Warranty
- Complete genset covered by Cummins Power Generation comprehensive warranty

Packaged Self-Contained Units
- Units with built in antivibration systems with provision for base fuel tank and other accessories

Cummins Engine
- Heavy duty 4 cycle water cooled engine
- Electronic governor control

Cooling System
- 40°C cooling package

Ready Filled
- Every set comes filled with lube oil and anti-freeze

Alternator
- Brushless Group made machine
- Close voltage regulation
- Rotor and exciter impregnated with oil and acid resisting resin
- 12 lead reconnectable
- Exceptional short circuit capability
- Low waveform distortion with non linear loads

Ratings
All kW Power ratings based on a 40°C ambient temperature reference.

Chassis
Built-in anti-vibration system
Bonded rubber units fitted as standard eliminates need for rubber mats or spring mountings

PCL 'Power Control' System
- CE compliant PCL-006
- Full AC instrumentation
- Emergency stop button
- Safety shutdowns
- Key or Remote starting

Alternative PCC PowerCommand Control System
- Microprocessor control
- Integrates governor and voltage regulation systems
- Superior alternator and genset protection system
- Accurate battery monitoring system
- Totally reliable and proven system

Quality Assurance
Registered Firm Certificate Number FM509 in accordance with:
BS EN ISO 9001

Quality Assurance Schedule 3420/1

One Source — Engine — Alternator — Controls — Generating Set — One Name

Cummins Power Generation, Cummins Engines and Newage Alternators are all part of the same group

50 Hz Ratings				
Model Prime	**Prime kW** (kVA)	**Model Standby**	**Standby kW** (kVA)	**Engine Model**
600 DFGD	**600** (750)	**660 DFGD**	**660** (825)	**VTA28G6**

A Single Source for *all* Power System Solutions

Specifications

Generator Set Performance

Voltage Regulation
Maintains voltage output to within ±1.0%.
At any power factor between 0.8 lagging and unity.
At any variations from No load to Full load.
At any variations from Cold to Hot.
At speed droop variations up to 4.5%.

Frequency Regulation
Isochronous under varying loads from no load to 100% full load when electronic governor is fitted.

Random Frequency Variation
Will not exceed ±0.25% of its mean value for constant loads – no load to full load.

Waveform
Total harmonic distortion open circuit voltage waveform in the order of 1.5%. Three-phase balanced load in the order of 5.0%.

Telephone Influence Factor (TIF)
TIF better than 50.
THF to BS4999 Part 40 better than 2%.

Alternator Temperature Rise
Class H insulation. Temperature rise up to 125°C permitted.

Radio Interference
In compliance with BS800 and VDE levels G and N.

Engine

Cummins VTA28G6 direct injection engines. 12-cylinder VT range.

Type
Water cooled, four cycle, turbo charged and aftercooled.

Construction
Four valves per cylinder, forged steel crankshaft and connecting rods, cast iron block, replaceable wet liners.

Starting
24 volt negative earth. Battery charging 35 amp alternator. Cranking current 1280 amps at 0°C.

Fuel System
24 volt fail safe fuel actuator. Dual spin-on paper element fuel filters. Cummins PT fuel injection system with integral electronic governor. Dual flexible fuel lines and connectors. Fuel/water separator.

Filters
Dry element air filters with restriction indicator and spin-on full flow paper element and by pass lube oil filters fitted. Corrosion resistor filter.

Cooling
40°C radiator as standard with 50°C ambient as option. Oil cooler.

Alternator

Type
Brushless, single bearing, revolving field, 4 pole, drip proof, screen protected.
Class H insulation.
Enclosed to IP22 (NEMA 1) standard.
IC 01 cooling system.
Fully interconnected damper winding.
AC exciter and rotating rectifier unit.
Epoxy coated stator winding.
Rotor and exciter impregnated with tropical grade insulating oil and acid resisting polyester resin.
Dynamically balanced rotor BS 6861: Part 1.
Sealed for life bearings.
Layer wound mechanically wedged rotor.

Exciter
Triple dipped in moisture, oil and acid resisting polyester varnish and coated with anti-tracking varnish.
Sealed solid state automatic voltage regulator – self-exciting, self-regulating.
Output windings with 2/3 pitch for improved harmonics and paralleling ability.
Close coupled engine/alternator for perfect alignment.

Compliance Standards

BS EN 60204-1:1998 IEC 60204-1:1997.
BS 7698 ISO 8528.
BS EN 12601:2001
BSEN 60439-1:1999 IEC 60439-1:1999.
BS EN 60204-1:1998 IEC 60204-1:1997.
BS EN 60529:1992
BS EN 50081-2:1994.
BS EN 61000-6-2:1999 IEC 61000-6-2:1999
BS EN ISO 3744:1995 ISO 3744:1994(E)
BS 5514/ISO 3046
BS EN 60034 series.

Chassis

Fabricated and welded steel chassis.
Built-in anti-vibration mountings.
Optional sub-base fuel tank with eight hour capacity, dual flexible fuel lines, dial type fuel gauge and drain bung.

Finish
Etch undercoated and finished in high gloss durable green.

General
Complete set of operating and instruction manuals.

Generator Set Options

Engine
- ☐ Heavy duty air cleaner
- ☐ Coolant heater and thermostat
- ☐ Tool kit
- ☐ Lead acid batteries, cable and fitted tray
- ☐ NiCad batteries
- ☐ Sump drain pump
- ☐ Oil and water drain taps
- ☐ CE Compliance (guarding)
- ☐ Exhaust temperature monitoring (PCC only)
- ☐ Tool kit

Cooling
- ☐ Remote radiator cooling (built to order)
- ☐ Oil temperature indication

Alternator
- ☐ Anti-Condensation heater
- ☐ Thermistors
- ☐ PMG Exciter and MX321 AVR

Exhaust System
- ☐ Industrial type silencer
- ☐ Residential type silencer
- ☐ Length of flexible exhaust and bellows

Fuel System
- ☐ Sub-base tanks
- ☐ Hand fuel transfer pump
- ☐ Automatic fuel transfer pump
- ☐ Free-standing 450, 900 and 1350 litre fuel tanks with stand
- ☐ Fuel tank level switch
- ☐ High fuel level warning
- ☐ Low fuel level warning
- ☐ Low fuel level shutdown

Generator Set
- ☐ Silenced enclosures

Control Panel
- ☐ See separate list on Control Panel page
- ☐ 3 or 4 pole circuit breaker
- ☐ Battery charger 5 amp or 10 amp
- ☐ CE Compliance PCL and PCC systems
- ☐ Cable entrance box

Power Control System (PCL)

PCL – Power Control System

- Choice of manual/key start or remote/automatic system
- Set mounted control panel on anti-vibration mounts
- Integrated circuit breaker (optional)

PCL-006 Control System

PCL-006 Controller

Standard Features

- Monitors engine performance and AC power output
- Microprocessor based design
- Automatic controls generator set, start and shutdown
- Clear digital backlit display with easy to read icons
- Four configurable warning LED's
- Scrolling digital display

Standard Specification

- AC Voltmeter display
- AC Ammeter display
- Generator Frequency Hz
- Engine RPM
- Engine Oil Pressure (PSI & Bar)
- Engine Temperature (°C & °F)
- Plant battery Volts
- Engine Hours run
- Start delay
- Automatic shutdown on fault conditions
- External remote start input
- LED and LCD alarm indication
- 3 position key switch Manual-Auto-Off
- Emergency stop
- PC Configurable via MS-Windows based software
- Real time diagnostics via MS-Windows

PCL-001 (Option) Manual Start System

- Key switch off/manual start positions
- Manual start pushbutton

PCL-002 (Option) Remote/Auto Start System

- Key switch off/auto and manual position
- Manual start pushbutton
- Fail to start LED indication
- Remote start 'active' LED indication
- Run on timer
- 3 attempts to start (adjustable) in auto mode
- Set will automatically start in event of receiving an external signal

PCL-001 Controller

Standard Specification

- Three ammeters 72 mm scale
- Voltmeter and selector switch
- Frequency (Hz) and RPM meter
- Hours run meter
- Oil pressure gauge
- Engine temperature gauge
- Battery condition meter
- Emergency stop shutdown pushbutton
- Dual scale indication
- Starting module (Manual or Remote)
- High engine temperature protection shutdown
- Low oil pressure protection shutdown
- Loss of coolant alarm and shutdown
- Overspeed/over frequency alarm and shutdown
- Underspeed/under frequency alarm and shutdown
- Charge alternator fault warning
- Common alarm indication
- Status and fault conditions display by LED illumination
- Remote emergency stop connections

CE Conformity

- For countries where applicable the equipment will meet CE conformity regulations and standards

Optional Features on PCL-001 and PCL-002

- Audible alarm - fitted or loose
- Volts adjustment control
- Low fuel level alarm and/or shutdown
- Overload current protection
- Common fault contact
- Annunciator units - 5 or 10 warnings
- Under/Over volts shutdown
- Low battery volts alarm
- Earth fault shutdown
- kW meter
- PF meter
- Oil temperature gauge
- 2 stage low oil pressure warning
- 2 stage high temperature warning
- High oil temperature warning or shutdown
- Speed trim adjustment
- Control panel heater
- Battery charger failure alarm

Remote Only:

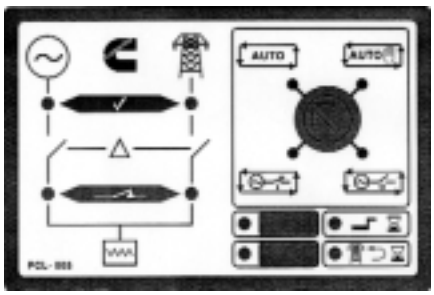
- Ready to accept load indicator
- System energised indicator
- Selector switch not-in-auto position indicator

PCL-005 System Automatic Mains Failure

- Module supplied loose or fitted in wall mounting cubicle
- Works in conjunction with System PCL-002 and PCL-006
- Adjustable voltage sensing on all three phases
- Provides signal to generator to start
- Provides signal to changeover switchgear
- Key control switch. Auto ON (2) RUN (2)
- Test positions permit RUN ON or off load
- LED indication for mains/power status
- Timers for mains fail, return time, warming time

Option

- 3 or 4 pole changeover panel



System PCL-005

Alternative PowerCommand Control System (PCC)

PCC PowerCommand Control –
standard configuration with optional contactor buttons shown

PowerCommand® Control with AmpSentry™ Protection

- Integrated automatic voltage regulator and engine speed governor
- AmpSentry Protection guards the electrical integrity of the alternator and power system from the effects of overcurrent, over/under voltage, under frequency and overload conditions
- Control components designed to withstand the vibration levels typical in generator sets

Standard Control Description

- Analog % of current meter (amps)
- Analog AC frequency meter
- Analog AC voltage meter
- Analog % of load meter (kW)
- Cycle cranking control
- Digital display panel
- Emergency stop switch
- Idle mode control
- Menu switch
- Panel backlighting
- Remote starting
- Reset switch
- Run-Off-Auto switch
- Sealed front panel, gasketed door
- Self diagnostics
- Separate customer interconnection box
- Voltmeter/Ammeter phase selector switch

Standard Performance Data

AC Alternator Data

- Current by Phase
- Kilowatts
- Kilowatt Hours
- Power Factor
- Voltage Line to Line
- Voltage Line to Neutral

Engine Data

- Battery Voltage
- Coolant Temperature
- Engine Running Hours
- Engine Starts counter
- Oil Pressure
- RPM
- Oil Temperature

EMC Compliance

The PCC control system meets EMC Shield Regulations.

Standard Protection Functions

Warnings

- High Coolant Temperature
- High DC Voltage
- Low Coolant Temperature
- Low DC Voltage
- Low Fuel – Day Tank
- Low Oil Pressure
- Over Current
- Oil Pressure Sender Fault
- Temperature Sender Fault
- Overload Load Shed Contacts
- Temperature Sender Fault
- Up to Four Customer Fault Inputs
- Weak Battery

Shutdowns

- Emergency Stop
- Fail to Crank
- Low Coolant Level (option for alarm only)
- Low Oil Pressure
- Magnetic Pickup Failure
- Overcrank
- Overcurrent
- Overspeed
- Short Circuit
- Underfrequency
- High/Low AC Voltage
- Shut down – low fuel level
- Earth fault. Shutdown
- High alternator temperature alarm/shutdown
- PowerCommand Digital Paralleling

Cummins Optional Network Communications

- Echelon LonWorks multidrop communication. Communication network up to 5000 feet (1523 m) in length
- Allows for local and remote communications with PowerCommand network products
- Power system monitoring and control using PowerCommand software
- Flexible for interface with other manufacturers' control and monitoring systems

Other PowerCommand Control options are available

Disconnector Switch

The addition of a circuit breaker is considered unnecessary when PowerCommand with Amp Sentry protection is fitted. For isolation purposes a switch disconnector can be supplied and mounted in the normal circuit breaker position on either side of the control panel.

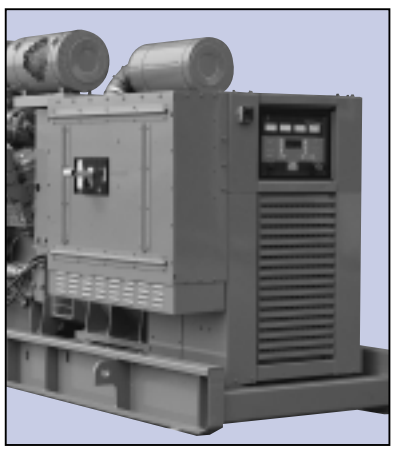
Voltage Regulation

±0.5% with PowerCommand fitted.

Options

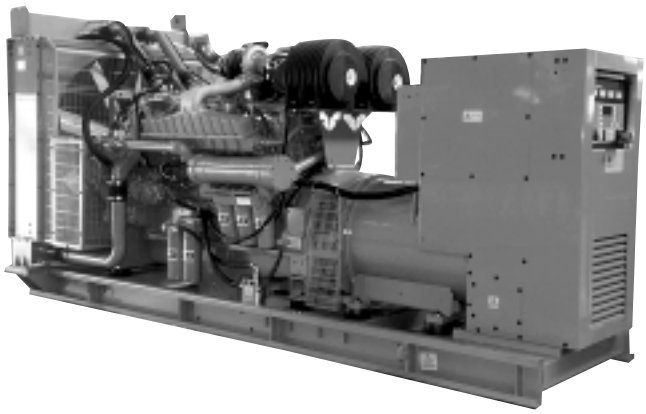
Control panel PowerCommand options

- Audible alarm and shutdown
- Key switch-operating mode
- Shutdown alarm-relay
- Running relays 4 pole D.T.
- Warning low fuel/high fuel



Circuit breaker can be fitted either side of generator set but supplied on R.H. side as standard.

Technical Data



Generating Sets – 50 Hz

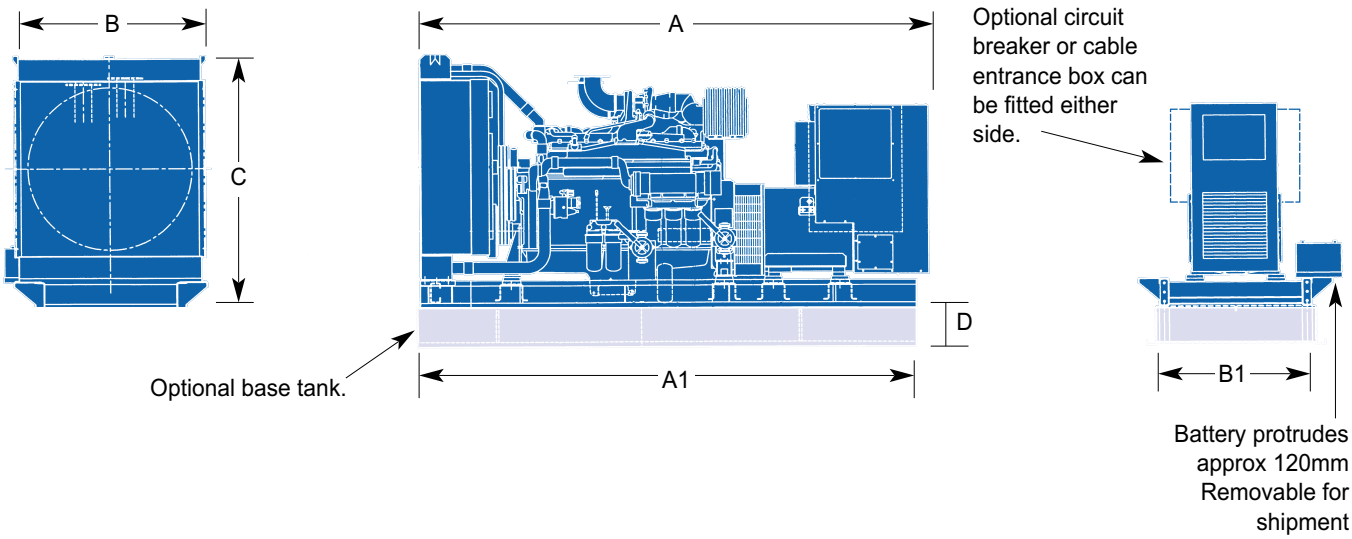
	Standby	Prime
Ratings	660kWe (825 kVA)	600kWe (750 kVA)
Model	660 DFGD	600 DFGD
Engine Model	VTA28G6	VTA28G6
No of Cylinders	12	12
Aspiration	Turbocharged & Aftercooled	Turbocharged & Aftercooled
Gross Engine Power Output	722 kWm	656 kWm
BMEP	2062 kPa	1874 kPa
Bore	140 mm	140 mm
Stroke	152 mm	152 mm
Piston Speed m/sec	7.6 m/s	7.6 m/s
Compression Ratio	13.0:1	13.0:1
Lube Oil Capacity	83 l	83 l
RPM	1500 RPM	1500 RPM
Fuel Consumption Load	1/4 1/2 3/4 Full	1/4 1/2 3/4 Full
Fuel Consumption – L/hr	40 81 121 162	36 73 110 147
Optional Base Tank Capacity l	1200 l	1200 l
Maximum Inlet Restriction	27 kPa	27 kPa
Maximum Return Restriction	22 kPa	22 kPa
Fan Load	19 kW	19 kW
Coolant Capacity (with radiator)	162 l	162 l
Coolant Flow Rate (engine jacket)	732 l/min	732 l/min
Heat Rejection to Eng Jacket Coolant	575 kW	575 kW
Heat Rejection to Aftercooler Coolant	NA	NA
Heat Rejection to Fuel	NA	NA
Heat Radiated to Ambient	90 kW	90 kW
Max Coolant Friction Head	55 kPa	55 kPa
Maximum Coolant Static Head	18.3 kPa	18.3 kPa
Max Top Tank Temp (engine jacket)	104°C	100°C
Combustion Air	55 m^3/min	49 m^3/min
Maximum Air Cleaner Restriction	85 kPa	85 kPa
Alternator Cooling Air	97 m^3/min	97 m^3/min
Radiator Cooling Air	750 m^3/min	750 m^3/min
Minimum Air Opening to Room (no attenuation)	4.1 m^2	4.1 m^2
Minimum Discharge Opening (no attenuation)	3.2 m^2	3.2 m^2
Max Static Restriction	13 mm Hg	13 mm Hg
Exhaust Gas Flow (Full Load)	132 m^3/min	120 m^3/min
Exhaust Gas Temperature	489°C	464°C
Maximum Back Pressure	10.1 kPa	10.2 kPa

Rating Definitions

Standby Rating based on: Applicable for supplying power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the standby power rating. This rating should be applied only where reliable utility power is available. A standby rated engine should be sized for a maximum of 70% average load factor and 200 hrs of operation per year. This includes a maximum of 1 hour in a 12 hour period at the standby power rating. Standby rating should never be applied except in true power outages.

Prime Rating based on: Prime Power is available continuously during the period of power outage in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any 24 hour period. A 10% overload capability is available for a period of 1 hour within a 12 hour period of operation.

Dimensions and Weights – 50 Hz



Model	Engine	New Dimensions and Weights (mm/kg)						Set Weight kg Dry	Set Weight kg Wet	Tank Weight kg (dry)	Tank Weight kg (wet)
		A	A1	B1	B	C	D				
DFGD	VTA28G6	3900	3875	1350	1423	1942	300	6389	6699	580	1580

Set weights are **without** sub-base tank.
Dimensions and weights are for **guidance** only. Do not use for installation design. Ask for certified drawings on your specific application.
Specifications may change without notice.

Power Generation

See your distributor for more information.

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