### Tier4 certified diesel generator set

**QST30 series engine**

900 - 1000 kW 60 Hz

### Description

Cummins® commercial generator sets are fully integrated power generation systems providing optimum performance, reliability and versatility for stationary Standby and Prime Power applications.

### Features

**Cummins heavy-duty engine** - Rugged 4-cycle, industrial diesel delivers reliable power, low emissions and fast response to load changes.

**Alternator** - Several alternator sizes offer selectable motor starting capability with low reactance 2/3 pitch windings, low waveform distortion with non-linear loads and fault clearing short-circuit capability.

**Cummins aftertreatment system** - Fully integrated power generation systems that are certified to EPA Tier 4 standards. They provide optimum performance, reliability and versatility for stationary Standby, Prime Power and Continuous duty applications.

**Permanent Magnet Generator (PMG)** - Offers enhanced motor starting and fault clearing short-circuit capability.

**Control system** - The PowerCommand® electronic control is standard equipment and provides total genset system integration including automatic remote starting/stopping, precise frequency and voltage regulation, alarm and status message display, AmpSentry™ protection, output metering, auto-shutdown at fault detection and NFPA 110 Level 1 compliance.

**Cooling system** - Standard integral set-mounted radiator system, designed and tested for rated ambient temperatures, simplifies facility design requirements for rejected heat.

**NFPA** - The genset accepts full rated load in a single step in accordance with NFPA 110 for Level 1 systems.

**Warranty and service** - Backed by a comprehensive warranty and worldwide distributor network.

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Standby rating</th>
<th>Prime rating</th>
<th>Emissions compliance</th>
<th>Data sheets</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60 Hz kW (kVA)</td>
<td>60 Hz kW (kVA)</td>
<td>EPA</td>
<td>60 Hz</td>
</tr>
<tr>
<td>DQFAH</td>
<td>1000 (1250)</td>
<td>900 (1125)</td>
<td>T4F certified</td>
<td>D-3535</td>
</tr>
</tbody>
</table>

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**Generator set specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governor regulation class</td>
<td>ISO8528 Part 1 Class G3</td>
</tr>
<tr>
<td>Voltage regulation, no load to full load</td>
<td>+/- 0.5%</td>
</tr>
<tr>
<td>Random voltage variation</td>
<td>+/- 0.5%</td>
</tr>
<tr>
<td>Frequency regulation</td>
<td>Isochronous</td>
</tr>
<tr>
<td>Random frequency variation</td>
<td>+/- 0.25%</td>
</tr>
<tr>
<td>Radio frequency emissions compliance</td>
<td>IEC 61000-4-2 : Level 4 Electrostatic discharge</td>
</tr>
<tr>
<td></td>
<td>IEC 61000-4-3 : Level 3 Radiated susceptibility</td>
</tr>
</tbody>
</table>

**Engine specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bore</td>
<td>140 mm (5.51 in)</td>
</tr>
<tr>
<td>Stroke</td>
<td>165.0 mm (6.5 in)</td>
</tr>
<tr>
<td>Displacement</td>
<td>30.5 litres (1860 in³)</td>
</tr>
<tr>
<td>Configuration</td>
<td>Cast iron, V, 12 cylinder</td>
</tr>
<tr>
<td>Battery capacity</td>
<td>1800 amps minimum at ambient temperature of -18 °C to 0 °C (0 °F to 32 °F)</td>
</tr>
<tr>
<td>Battery charging alternator</td>
<td>35 amps</td>
</tr>
<tr>
<td>Starting voltage</td>
<td>24 volt, negative ground</td>
</tr>
<tr>
<td>Fuel system</td>
<td>Direct injection: number 2 diesel fuel, fuel filter, automatic electric fuel shutoff</td>
</tr>
<tr>
<td>Fuel filter</td>
<td>Triple element, 10 micron filtration, spin-on fuel filters with water separator</td>
</tr>
<tr>
<td>Air cleaner type</td>
<td>Dry replaceable element</td>
</tr>
<tr>
<td>Lube oil filter type(s)</td>
<td>Four spin-on, combination full flow filter and bypass filters</td>
</tr>
<tr>
<td>Standard cooling system</td>
<td>High ambient radiator</td>
</tr>
</tbody>
</table>

**Aftertreatment specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>CA451</td>
</tr>
<tr>
<td>Emissions certification</td>
<td>Tier4F certified</td>
</tr>
<tr>
<td>Duct diameter</td>
<td>1143 mm (45 in)</td>
</tr>
<tr>
<td>Duct quantity</td>
<td>1</td>
</tr>
<tr>
<td>Components included</td>
<td>Insulated aftertreatment ducts, saddle supports for aftertreatment, control panel, DEF tank, heater with ILB, harness from control panel to engine and AFT, lifting tool. Assembly required at site.</td>
</tr>
</tbody>
</table>

**Alternator specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design</td>
<td>Brushless, 4 pole, drip proof, revolving field</td>
</tr>
<tr>
<td>Stator</td>
<td>2/3 pitch</td>
</tr>
<tr>
<td>Rotor</td>
<td>Single bearing, flexible disc</td>
</tr>
<tr>
<td>Insulation system</td>
<td>Class H on low and medium voltage, Class F on high voltage</td>
</tr>
<tr>
<td>Standard temperature rise</td>
<td>150 °C Standby at 40 °C ambient</td>
</tr>
<tr>
<td>Exciter type</td>
<td>Permanent Magnet Generator (PMG)</td>
</tr>
<tr>
<td>Phase rotation</td>
<td>A (U), B (V), C (W)</td>
</tr>
<tr>
<td>Alternator cooling</td>
<td>Direct drive centrifugal blower fan</td>
</tr>
<tr>
<td>AC waveform Total Harmonic Distortion (THDV)</td>
<td>&lt; 5% no load to full linear load, &lt; 3% for any single harmonic</td>
</tr>
<tr>
<td>Telephone Influence Factor (TIF)</td>
<td>&lt; 50% per NEMA MG1-22.43</td>
</tr>
<tr>
<td>Telephone Harmonic Factor (THF)</td>
<td>&lt; 3%</td>
</tr>
</tbody>
</table>
Available voltages

<table>
<thead>
<tr>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/208</td>
</tr>
<tr>
<td>220/380</td>
</tr>
<tr>
<td>240/416</td>
</tr>
<tr>
<td>277/480</td>
</tr>
<tr>
<td>139/240</td>
</tr>
<tr>
<td>230/400</td>
</tr>
<tr>
<td>255/440</td>
</tr>
<tr>
<td>347/600</td>
</tr>
</tbody>
</table>

Note: Consult factory for other voltages.

Generator set options and accessories

**Engine**
- 208/240/480 V coolant heater for ambient above 4.5 °C (40 °F)
- 208/240/480 V coolant heater for ambient below 4.5 °C (40 °F)

**Control panel**
- 120/240 V 100 W control anti-condensation heater
- Paralleling configuration
- Remote fault signal package
- Run relay package

**Alternator**
- 80 °C rise
- 105 °C rise
- 125 °C rise
- 120/240 V 300 W, anti-condensation heater
- Temperature sensor - RTDs, 2-phase
- Temperature sensor – alternator bearing RTD
- Differential current transformers

**Aftertreatment system**
- DEF lines
- DEF freeze protection kit
- SCR only
- SCR w/ heater (ILB)
- SCR w/ heater and DPF

**Cooling system**
- Remote radiator
- Temperature sensor – alternator bearing RTD
- Differential current transformers

**Generator set**
- AC entrance box
- Battery
- Battery rack with hold-down - floor standing
- Circuit breaker - set mounted
- Disconnect switch - set mounted
- PowerCommand network
- Remote annunciator panel
- Spring isolators
- 2 year warranty
- 5 year warranty
- 10 year major components warranty

Note: Some options may not be available on all models - consult factory for availability.
PowerCommand 3.3 Control System

An integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1570 for more detailed information on the control.

**AmpSentry** – Includes integral AmpSentry protection, which provides a full range of alternator protection functions that are matched to the alternator provided.

**Power management** – Control function provides battery monitoring and testing features and smart starting control system.

**Advanced control methodology** – Three phase sensing, full wave rectified voltage regulation, with a PWM output for stable operation with all load types.

**Communications interface** – Control comes standard with PCCNet and Modbus interface.

**Regulation compliant** – Prototype tested: UL, CSA and CE compliant.

**Service** - InPower™ PC-based service tool available for detailed diagnostics, setup, data logging and fault simulation.

**Easily upgradeable** – PowerCommand controls are designed with common control interfaces.

**Reliable design** – The control system is designed for reliable operation in harsh environment. Multi-language support

**Operator panel features**

**Operator/display functions**
- Displays paralleling breaker status
- Provides direct control of the paralleling breaker
- 320 x 240 pixels graphic LED backlight LCD
- Auto, manual, start, stop, fault reset and lamp test/panel lamp switches
- Alpha-numeric display with pushbuttons
- LED lamps indicating generator set running, remote start, not in auto, common shutdown, common warning, manual run mode, auto mode and stop

**Paralleling control functions**
- First Start Sensor System selects first generator set to close to bus
- Phase Lock Loop Synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Load govern control for utility paralleling
- Extended Paralleling (baseload/peak shave) Mode
- Digital power transfer control, for use with a breaker pair to provide open transition, closed transition, ramping closed transition, peaking and base load functions.

**Alternator data**
- Line-to-neutral and line-to-line AC volts
- 3-phase AC current
- Frequency
- kW, kvar, power factor kVA (three phase and total)

**Engine data**
- DC voltage
- Engine speed
- Lube oil pressure and temperature
- Coolant temperature
- Comprehensive FAE data (where applicable)

**Other data**
- Genset model data
- Start attempts, starts, running hours, kW hours
- Load profile (operating hours at % load in 5% increments)
- Fault history
- Data logging and fault simulation (requires InPower)

**Standard control functions**

**Digital governing**
- Integrated digital electronic isochronous governor
- Temperature dynamic governing

**Digital voltage regulation**
- Integrated digital electronic voltage regulator
- 3-phase, 4-wire line-to-line sensing
- Configurable torque matching

**AmpSentry AC protection**
- AmpSentry protective relay
- Over current and short circuit shutdown
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse var shutdown
- Field overload shutdown

**Engine protection**
- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking lockout
- Sensor failure indication
- Low fuel level warning or shutdown
- Fuel-in-rupture-basin warning or shutdown
- Full authority electronic engine protection

**Control functions**
- Time delay start and cool down
- Real time clock for fault and event time stamping
- Exerciser clock and time of day start/stop
- Data logging
- Cycle cranking
- Load shed
- Configurable inputs and outputs (4)
- Remote emergency stop

**Options**
- Auxiliary output relays (2)
Generator set weights and dimensions
* Weights represent a set with standard features. See outline drawings for weights of other configurations.

<table>
<thead>
<tr>
<th>Model</th>
<th>Dim “A” mm (in.)</th>
<th>Dim “B” mm (in.)</th>
<th>Dim “C” mm (in.)</th>
<th>Set weight* dry kg (lbs)</th>
<th>Set weight* wet kg (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DQFAH</td>
<td>4239 (167)</td>
<td>2000 (79)</td>
<td>2353 (93)</td>
<td>7631 (16824)</td>
<td>7929 (17480)</td>
</tr>
</tbody>
</table>

Aftertreatment weights and dimensions
* Due to multiple configurations of the CA451 model, maximum weight of the model is shown.
Note: Dimension and weights are subject to change. See submittal data for exact details.

<table>
<thead>
<tr>
<th>Aftertreatment model number*</th>
<th>Genset model</th>
<th>L (Length) mm (in.)</th>
<th>W (Width) mm (in.)</th>
<th>H (Height) mm (in.)</th>
<th>Weight of aftertreatment system (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA451</td>
<td>DQFAH</td>
<td>4651 (183)</td>
<td>1480 (58)</td>
<td>1260 (50)</td>
<td>4367</td>
</tr>
</tbody>
</table>

Codes and standards
Codes or standards compliance may not be available with all model configurations – consult factory for availability.

<table>
<thead>
<tr>
<th>Codes and standards</th>
<th>Compliance details</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO8528</td>
<td>The generator set has been rated in accordance with ISO8528.</td>
</tr>
<tr>
<td>International Building Code</td>
<td>The genset package is certified for seismic application in accordance with the following International Building Code: IBC2012. The Prototype Test Support (PTS) program verifies the performance integrity of the generator set design. Cummins products bearing the PTS symbol meet the prototype test requirements of NFPA 110 for Level 1 systems. The Aftertreatment System bears the ETL ListedMark as proof of conformity to NFPA 79, UL 61010C-1, and CSA 22.2 No. 61010C-1-12. The generator set is available listed to UL 2200 for all 60 Hz low voltage models, Stationary Engine Generator Assemblies. The PowerCommand control is Listed to UL 508 - Category NITW7 for U.S. and Canadian usage. Circuit breaker assemblies are UL 489 Listed for 100% continuous operation and also UL 869A Listed Service Equipment.</td>
</tr>
</tbody>
</table>

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building’s electrical system except through an approved device or after building main switch is open.

For more information contact your local Cummins distributor or visit power.cummins.com

Our energy working for you.*

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