



# Every<sup>™</sup> Capability. One Commitment.

Cummins Oil And Gas Drilling Applications.



# Local Partners. Global Strength.



## No Matter How Remote, We Are There For You.

For Cummins, meeting the power demands placed on your oil and gas drilling rigs is backed by our commitment to deliver the specific product performance solutions and advantages that your business needs, and to support your operation worldwide with absolute dependability. Cummins goes beyond the presence of a global network to provide strong on-site support, no matter where on earth your site may be.

The Cummins network spans the globe, providing all of the necessary support you need in over 160 countries:

- 24/7/365 responsiveness
- Over 5,500 distributor, service and dealer locations
- Immediate parts and service availability
- Local “critical parts” support
- Complete engineering, installation, employee training
- Full life cycle support

With the strength of Cummins at your side, your drilling and exploration initiatives can reach further, with increased uptime and greater productivity. Most important, our presence and support worldwide make Cummins a proven, committed oil and gas partner you can always depend on.

## Proven Durability In Extreme Conditions.

Every Cummins customer has the advantage of proven engine and power generation platforms, from complete mechanical rig power units to offshore and land-based power modules. The Cummins product lineup is designed to provide our oil and gas customers with the highest levels of reliability, durability, performance and dependability at the lowest cost of operation. Cummins oil and gas technology is engineered and built with the capabilities needed to sustain your operation under the harshest and most extreme conditions.

The key to Cummins durability in the field is our focus on developing proven products designed and engineered specifically for drilling applications. We take advantage of every opportunity to use our proven field network to listen to what our oil and gas customers are saying about their specific needs. The voice of the customer is systematically incorporated into every solution we engineer, design and build for oil and gas applications.

Our power modules are developed with Cummins-manufactured engines, alternators, turbochargers, filtration and emissions solutions components. Which is why Cummins is uniquely positioned to provide a total solution to our drilling customers as a true single-source supplier.





### **Global Support. Delivered Locally.**

Our service capabilities clearly set Cummins apart from the competition. With Cummins, you'll gain the advantage of complete on-site support through engineering, site planning, installation and start-up. Cummins is committed to equipping operators with the right parts inventory, and providing resources to train operators on-site. This knowledge of Cummins technology allows operations to maintain power throughout every challenge faced in each application.

Our comprehensive approach gives our customers unparalleled advantages for planning, implementation and life cycle management. Of course, the strength of our established global support network allows us to be exceptionally responsive to your needs.

The entire Cummins team understands the need to match your specific project requirements. We are ready to deliver industry-focused solutions and the broad infrastructure needed to help you master your drilling challenges. Our engineering team stands ready to assist you at every step.

### **Established Networks Make Your World More Productive.**

The support of our established worldwide service network is one business advantage that every Cummins customer enjoys. We service the needs of oil and gas customers worldwide every day through our 550 distributor facilities and more than 5,500 worldwide locations. The Cummins organization possesses a vast amount of knowledge in oil and gas installation and operations. We are ready to assist you with local support — fully backed by the strength of Cummins ongoing commitment to the oil and gas market worldwide.

As a result, our oil and gas customers know they can depend on Cummins for industry-leading technology and complete support. In addition, proven engineering expertise that makes all the difference throughout the critical installation and start-up phase.

For more about the proven advantages of Cummins technology for oil and gas applications, see your local Cummins distributor. Or visit [CumminsOilandGas.com](http://CumminsOilandGas.com).

# Control Technology.

## PowerCommand® System Control.

The PowerCommand control system is a microprocessor-based generator set monitoring, metering and control system designed to meet the demands of today's engine-driven generator sets. These control systems have been designed and tested to meet the drilling environment in which gensets are typically applied.

The PowerCommand control is compatible with shunt or PMG excitation style. It is suitable for users with reconnectable or non-reconnectable generators, and can be configured for any frequency, voltage and power connection.

Power for the control system is derived from the generator set starting batteries. The control functions over a voltage range from 8 VDC to 30 VDC.



## Human Machine Interface (HMI) Capability.

- **Operator adjustments** — The HMI includes provisions for many setup and adjustment functions.
- **Generator set hardware data** — Access to the control and software part number, and generator set rating in KVA is provided from the HMI.
- **Data logs** — Logs include engine run time, controller on time, number of start attempts.
- **Fault history** — The system provides a record of the most recent fault conditions with control hours time stamp. Up to 10 events are stored in the control non-volatile memory.

## Features.

### Instrumentation:

- Electronic instrument panel
- DC power, warning and shutdown indicators

### Analog gauges:

- Oil pressure
- Fuel filter differential
- Exhaust temperature (left and right bank)
- Jacket water temperature
- Aftercooler water temperature
- Engine speed

### Digital display:

- Air cleaner restriction warning
- Hours
- Warning and shutdown information
- Fault history
- Fuel consumption

# Emissions Technology.

In every corner of the globe, Cummins provides reliable, efficient and easy-to-use prime power systems for oil and gas operations.

## Committed To Clean Air.

Cummins is committed to meeting or exceeding all global air-quality regulatory standards. The real challenge in designing cleaner diesel engines is reducing NOx and PM emissions while maintaining performance. The Cummins Quantum engine technology meets this challenge by reducing emissions without sacrificing engine performance or reliability, or complicating maintenance.

Cummins has been a leader in the move to cleaner, quieter and more efficient diesel engine powered generator sets in compliance with new requirements:

- Cummins was the first manufacturer to introduce Environmental Protection Agency (EPA) Tier 2 and Tier 3 generator sets — ahead of the regulatory deadline.
- Cummins was the first generator manufacturer to introduce European Union (EU) Stage IIIA- and Stage II-compliant diesel engines to Europe.

- Cummins is a recognized leader in new technologies that reduce engine emissions. In fact, our innovative Cummins Quantum engine technology system focuses on in-cylinder design improvements that eliminate pollutants before they are formed.

## Advanced Fuel Injection Systems.

The Cummins Modular Common Rail fuel injection system provides improved idle stability, cold-start and response to transient load changes while maintaining power densities.

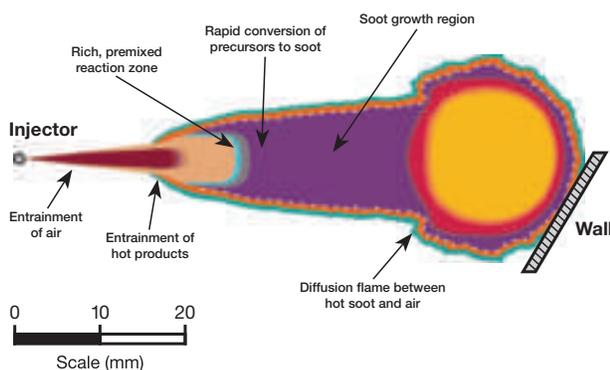
## Advanced Electronic Engine Controls.

New electronic sensors and microprocessor-based controls have greatly improved fuel efficiency and power output while decreasing the production of both NOx and PM. By controlling fuel quantity, injection timing, turbocharger boost pressure and other factors, electronic engine controls maintain optimum combustion efficiencies by compensating for load, temperature, fuel energy content, barometric pressure and even engine wear.

## Durable, Ferrous Cast Ductile (FCD) Cast-Iron Pistons.

All of our high-horsepower engines utilize a new FCD single-piece, cast-iron piston for an increase in power cylinder durability of up to 15 percent.

## Combustion optimization



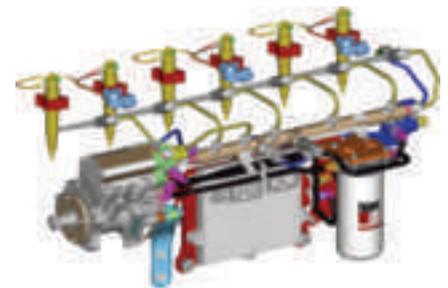
- Fuel-rich, premixed flame
- Initial soot formation
- Thermal NO production zone
- Soot oxidation zone

## Cast-iron pistons



New tier-compliant designs incorporate FCD cast-iron pistons. A simplified valve train reduces loading on crankshafts and gear train.

## High Pressure Common Rail



### Enhances engine performance:

- Reduces noise and smoke
- Improves idle stability
- Improves low-end torque
- Produces cleaner combustion

# Case Histories.

## **Dependable Performance Creates Enduring Relationships.**



### **Trinidad Drilling Calgary, Alberta, Canada**

With drilling operations that include 110 rigs in Canada and the United States, Trinidad Drilling must confront a wide range of tough environments and conditions. To meet its 24/7 power requirements, Trinidad chooses Cummins drilling products, both mechanical and SCR, for durability, reliability and economical operation.

According to Jim Wildeboer, Trinidad field supervisor, the decision to specify Cummins is based on the fact that its earlier supplier's products were unable to survive over the long term. "We found our motors were only lasting 20,000 hours and were pretty much finished at that point," Wildeboer said. "That's just not acceptable."

Over the past few years, Wildeboer's team has been installing Cummins products on its rigs and the experience has changed dramatically for the better.

"With Cummins, we've done our planned overhauls at 20,000 hours and we're typically reaching 40,000 hours of uptime without any problems. The savings in that alone are significant."

A more surprising benefit for Trinidad has been the increased fuel economy of its Cummins power systems. "We're finding we are using up to 300 liters less per day, per rig," Wildeboer said. "That alone makes these units a lot less costly to run. We didn't expect that, but we're happy to get it."

### **Orion Drilling Corpus Christi, Texas, United States**

Rig builder Orion Drilling runs drilling operations in the east and south Texas fields. Gregg Deeb, project manager, says the key to success for its suppliers is clear, "complete reliability is the most important factor. Except when relocating a rig, we're drilling 24/7, and we can't afford to have major equipment down."

To meet its rigorous standards, Orion uses Cummins SCR systems to provide the power requirements on its rigs. "For all intents and purposes, we operate all-electric rigs," Deeb said. "We run seven 800-hp traction motors to make everything work. Cummins engines provide all the power and electricity to run the rigs."



Orion expects upfront support during the rig-building process and continued support throughout day-to-day drilling operations. “The vast majority of Cummins support comes while the rig is under construction,” said Deeb.

“From engine start-up to load-testing and commissioning, we spend 90 to 95 percent of our time working with Cummins on getting the engines ready in the yard, before they go out to the field.”

Oil and gas drilling is a business of partnerships and commitments – and that provides Cummins with an advantage. “We haven’t really had to ask for anything and that always makes for a good relationship,” Deeb said. “We’ve grown rapidly already, and Orion’s going to continue to grow. I see Cummins as an integral part of that.”

**Pearl Energy**  
**Jasmine Offshore Oilfield, Gulf Of Thailand**

Pearl Energy operates the Jasmine Offshore Oilfield in the Gulf of Thailand, which comprises three offshore oil platforms: Jasmine A, B and C.

For its oil platforms, Pearl Energy turns to Cummins Power Generation to meet its requirements for reliable, uninterrupted power supply around the clock.

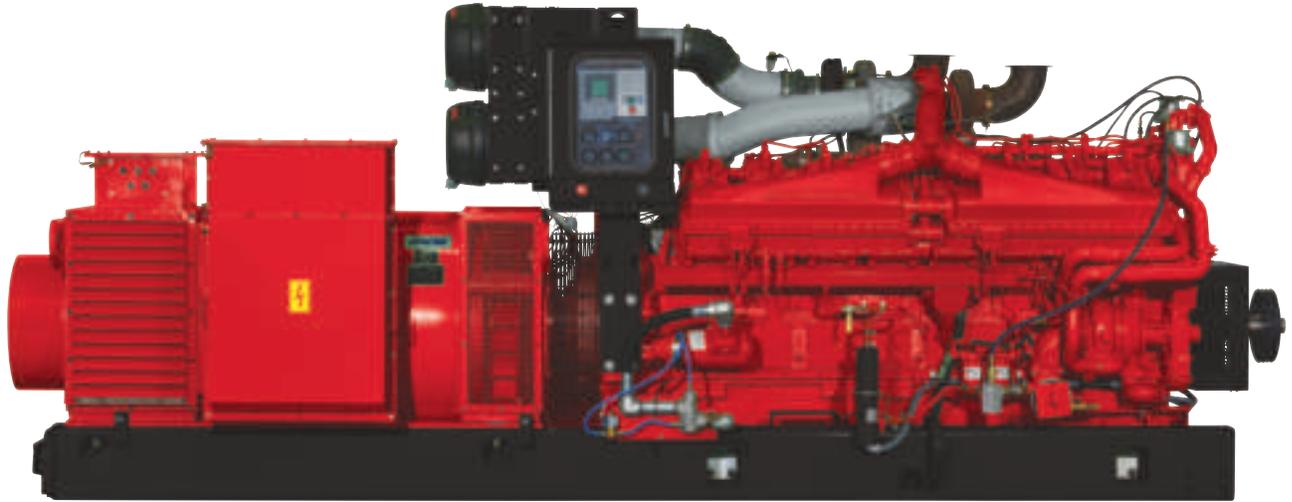
The three oil platforms rely on nine Cummins-powered gensets — three on each platform — to keep all equipment and activities running 24/7 on each platform.

PowerCommand Digital Master Control 200 is used to synchronize the operation of the gensets on each platform. This high-quality control system provides advanced functionality, optimum system reliability, and greater serviceability of the gensets.

Charlie Gawthorne, Project and Facilities Manager of Jasmine Platform B, credited Cummins integrated prime power system for the outstanding yield of his platform. “Contributing to the impressive performance of the Jasmine B development is the expertise of the installed equipment and systems – powered by Cummins gensets with total reliability.”



# Cummins Oil And Gas Drilling Power Modules.

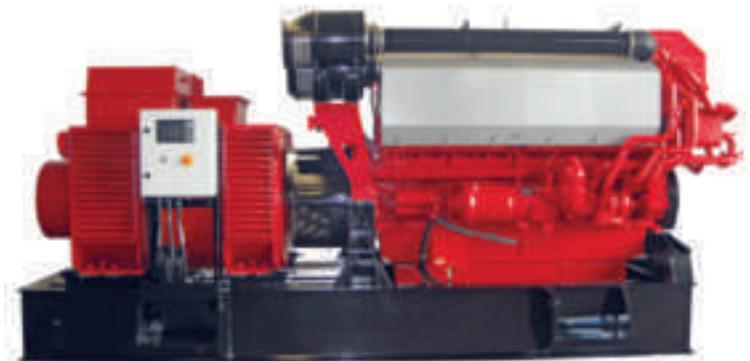


**QSK50 Land Power Module**

## **Cummins Land-Based Drilling Power Modules.**

These power modules are designed and tested based on oil field customer requirements to provide optimum performance, reliability and versatility for oil and gas land-drilling applications. Features include:

- **Cummins Heavy-Duty engine** — Rugged 4-cycle industrial diesel delivers reliable power, low emissions and fast response to load changes.
- **Alternator** — Form-wound stator and rotor; designed, tested and sized for drill rig service; low waveform distortion with non-linear loads; fault-clearing short-circuit capability.
- **Control system** — Engine monitoring and shutdown functions with easy-to-read analog gauges for critical parameters and a digital alarm and status message display.
- **Factory-installed heavy-duty air cleaners**
- **Factory-installed air inlet shutoff valve**
- **Inner rail system three-point mounted to sub-base** — Vibration isolators at mounting points. Lift provisions on base.
- **Low exhaust emissions** — Available with engine verified to U.S. EPA Nonroad Source Emissions Standards, 40 CFR 89, Tier 2.



**QSK60 Offshore Power Module**

## Land Based Oilfield Auxiliary Power

ENGINE MODEL	DISPLACEMENT (L)	FREQUENCY (Hz)	VOLTAGE (V)	SPEED (RPM)	ENGINE RATING (BHP) <sup>(1)</sup>	ENGINE RATING (kWe) <sup>(2,3)</sup>	EMISSIONS <sup>(4,6)</sup>
QSX15	15	50/60	400/480	1500/1800	495 - 620	354 - 443	US EPA Nonroad, CARB
KTA19 / QSK19	19	50/60	400/480	1500/1800	525 - 815	375 - 583	US EPA Nonroad, CARB

## Land Based Drilling Power Modules

ENGINE MODEL	DISPLACEMENT (L)	FREQUENCY (Hz)	VOLTAGE (V)	SPEED (RPM)	ENGINE RATING (BHP) <sup>(1)</sup>	ENGINE RATING (kWe) <sup>(2,3)</sup>	EMISSIONS <sup>(4,6)</sup>
QSK23	23	50/60	380/600	1500/1800	765 - 1085	547 - 776	US EPA Nonroad, CARB
QST30	30	50/60	380/600	1500/1800	935 - 1350	669 - 966	US EPA Nonroad, CARB
KTA50 / QSK50	50	50/60	600/690	1200/1500	1470 - 1750	1052 - 1252	US EPA Nonroad, CARB

## Mechanical Drilling Engines

ENGINE MODEL	DISPLACEMENT (L)	FREQUENCY (Hz)	VOLTAGE (V)	SPEED (RPM)	ENGINE RATING (BHP) <sup>(1)</sup>	ENGINE RATING (kWm) <sup>(2)</sup>	EMISSIONS <sup>(4,6)</sup>
QSB3.3	3.3	X	X	2200/2600	75 - 110	55 - 82	US EPA Nonroad, CARB, EU Stage
QSB6.7	6.7	X	X	1800/2300	133 - 270	99 - 201	US EPA Nonroad, CARB, EU Stage
QSL9	9	X	X	1800/2100	280 - 350	208 - 261	US EPA Nonroad, CARB, EU Stage
QSM11	11	X	X	1800/2100	300 - 446	223 - 332	US EPA Nonroad, CARB, EU Stage
QSX15	15	X	X	1800/2100	450 - 665	335 - 495	US EPA Nonroad, CARB, EU Stage
QSK19	19	X	X	1800/2100	755 - 800	563 - 596	US EPA Nonroad
QSK23	23	X	X	1800/2100	760 - 950	566 - 708	US EPA Nonroad
QST30	30	X	X	1800/2100	950 - 1500	708 - 1118	US EPA Nonroad
QSK38	38	X	X	1200/1800	920 - 1260	686 - 939	US EPA Nonroad
QSK50	50	X	X	1200/1900	1300 - 2500	969 - 1864	US EPA Nonroad
QSK60	60	X	X	1200/1900	1600 - 3000	1193 - 2237	US EPA Nonroad

## Offshore Emergency Gensets

MODEL	DISPLACEMENT (L)	FREQUENCY (Hz)	VOLTAGE (V)	SPEED (RPM)	ENGINE RATING (BHP) <sup>(1)</sup>	ENGINE RATING (kWe) <sup>(2,3)</sup>	EMISSIONS <sup>(7)</sup>
6B-CP	5.9	50/60	380/480	1500/1800	X	80/99	N/A
6C-CP	8.3	50/60	380/480	1500/1800	X	136/170	IMO
K19-CP	19	50/60	380/480	1500/1800	X	335/460	IMO
K38-CP	38	50/60	380/480	1500/1800	X	760/920	IMO
K50-CP	50	50/60	380/480	1500/1800	X	1050/1240	IMO

## Offshore Drilling Power Modules

ENGINE MODEL	DISPLACEMENT (L)	FREQUENCY (Hz)	VOLTAGE (V)	SPEED (RPM)	ENGINE RATING (BHP) <sup>(1)</sup>	ENGINE RATING (kWe) <sup>(2,3)</sup>	EMISSIONS <sup>(5)</sup>
QSK50	50	50/60	600/690	1200/1500/1800	1470 - 1971	1052 - 1411	US EPA Marine, IMO, EU
QSK60-DR	60	50/60	600/690	1200/1500/1800	1855 - 2500	1327 - 1789	US EPA Marine, IMO, EU

(1) Other ratings may be available. Some ratings may be restricted and may require approval for use. Please contact your distributor.

(2) Prime power ratings with 10% overload. This power rating conforms to ISO 8528 guidelines.

(3) kWe reflects the approximate amount of electrical power available when used in genset configuration. Some ratings may be preliminary. Please contact your distributor.

(4) Engine will comply with EPA Nonroad Tier 4 Interim requirements using Transitional Program for Equipment Manufacturers (TPEM).

(5) Engine will comply with IMO 2 standards, which enter into effect on January 1, 2011 for engines above 130 kW.

(6) Non certified ratings are also available. Please contact your distributor.

(7) Emergency Gensets are exempt from IMO emissions legislation. Ratings are IMO 1 compliant when applicable.

# Our Entire Company Behind Every Product.

Cummins power comes from more than just our engines. It comes from thousands of verified service technicians, trained and equipped with the latest diagnostic and repair tools. It comes from distribution centers, dedicated personnel and service trucks delivering millions of the highest-quality parts — Genuine Cummins and Cummins ReCon. It comes from instant access to parts, service, warranty and other information over the Internet. It comes from the most comprehensive parts and service network in the world, a total system built to meet the toughest standards in the world. Yours.

## **Genuine Cummins Parts.**

In some ways, one piston might look much the same as another. Yet closer inspection will reveal that there are dramatic differences between Genuine Cummins Parts and others. Differences in design, tolerances and materials. The truth is, Genuine Cummins Parts deliver improved performance and longer life between overhauls. Our parts:

- Meet exacting Cummins specifications
- Utilize advanced materials
- Incorporate state-of-the-art Cummins design technology
- Are continuously improved
- Have an industry-leading warranty.
- Are backed by a worldwide service organization. Beyond standard warranty, Cummins distributors are prepared to offer extended maintenance and repair plans.

## **Genuine ReCon® Parts.**

In addition to Genuine Cummins new parts, we offer a full range of Genuine Cummins ReCon parts. ReCon parts from Cummins aren't just repaired or rebuilt; they're remanufactured. Every part is completely torn down, cleaned and brought back to Cummins specifications. These ReCon parts come with a full worldwide warranty.

An extensive inventory of Genuine Cummins new and ReCon parts is available at all authorized Cummins service facilities:

- Cummins ReCon electrics
- ReCon water pumps
- ReCon turbochargers
- ReCon fuel systems
- ReCon injectors
- Fuel pumps — Heavy-Duty and MidRange
- ReCon cylinder heads
- ReCon air compressors
- Prelub™ starters

## **Rapid Response.**

Cummins is committed to understanding and meeting our customers' needs worldwide — through trusted local relationships, innovative solutions and dedicated customer service. This promise enables us to deliver power wherever, whenever and however it is needed. Our worldwide distribution network includes 550 distributors, 5,000 sales and service locations and 20 parts distribution centers. That means you can expect a face-to-face, trustworthy relationship and fast access to reliable service, engine expertise and parts support. Service features include:

- **Comprehensive factory training for all technicians**
- **Mobile QuickServe® and 24/7 support operations**
  - Action plan within 30 minutes
  - Technician dispatched within four hours
  - Full parts inventory at every location
- **QuickServe® Online** ([quickserve.cummins.com](http://quickserve.cummins.com))  
An Internet-based reference for Cummins parts and service information providing engine data and access to service resources for global support of all oil and gas drilling projects.
- **Smart tools such as INSITE™ software**
  - Rapid diagnostics
  - Troubleshooting
- **The most comprehensive warranty in the business:**
  - Covers all factory-supplied components
  - Includes items manufactured by outside vendors





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