



*HSK78G is a completely new design from the skid up.*

# GIVING IT THE GAS

**The HSK78G is the second engine/generator set to emerge from a Cummins R&D project which represents an investment of more than US\$1 billion. The first product was the QSK95, a 95-litre V16 that has set new efficiency standards as a 4000 hp-plus diesel engine and 3.75 MW generator set.**

The HSK78G offers a total package of gas generator capabilities and innovative gas technology for prime and peaking power applications. With a power density of up to 2.0 MW from the compact 78-litre, V12 gas engine, the HSK78G generator series is a completely new design from the skid up, providing reliable power regardless of the natural gas source or the climate, including blistering heat up to 55 degrees Celsius and extreme altitudes. The 78-litre Cummins gas engine is not a derivative of a diesel unit; it is designed specifically for gas.

“The new technology incorporated in the HSK78G represents a bold step into the gas arena for Cummins, pushing new levels of efficiency, transient performance and gas variation well beyond former natural gas generators,” says David Eccleston, Cummins South Pacific business manager for power generation.

He points out that in its class, the HSK78G has the industry’s longest major overhaul service cycle of 80,000 hours. The model line-up (50 Hz) includes 2 MWe, 1.8 MWe and 1.6 MWe units which are suitable for a diverse set of industries from mining and manufacturing to shopping malls and hospitals.

## **High electrical efficiency.**

“A high electrical efficiency of up to 44.2% (50 Hz) is achieved on a wide range of gases down to 70 methane number (MN) without impacting power output or efficiency,” says David Eccleston.

“New technology and electronic engine management systems allow the generator to automatically manage fuel gas quality fluctuations to ensure zero loss in performance via advanced on-board diagnostic control systems.”

Peak efficiency is maintained by automatic engine adjustments, which account for fuel quality changes and quick load-step performance, without the need to re-calibrate or switch off the genset. As a result, customers can expect more stability, greater uptime and lower fuel costs leading to lower total cost of ownership. In the case of a grid failure, the HSK78G can also switch to island mode offering customers more uptime and reliability.

The HSK78G models are designed to achieve a 30% load step (as per ISO8528 G1) with four steps to full load providing superior load pickup and load rejection transient capabilities, resulting in fewer voltage and frequency disturbances and faster recovery times. As a result, customers can expect a more stable power supply which is critical especially for island mode and emergency operations.

Cummins offers the most sophisticated predictive diagnostics in the industry, driven by innovative tools like onboard spark plug sensors, NOx sensors, and real-time trend data collection. The full package of onboard HSK78G diagnostics minimises unscheduled downtime while enabling customers to accurately predict maintenance needs and optimise maintenance costs.

## **At Wiluna gold mine.**

Established in the early 1990s, Perth-based Contract Power Group specialises in the design, procurement, installation and operation of remote gas and diesel-fired power stations. The company builds, owns and operates many of its power stations which generate electricity for both mining operations and remote town sites, and it also provides turn-key solutions for clients.



Contract Power general manager Marc Grosser... "It was great to hear that this product could respond to extreme conditions while still offering high efficiency and good load transient capabilities."

HSK78G at Wiluna gold mine... the first in-service unit in the world.

In 2016, Contract Power Group was awarded a contract to build, own and operate a power station for Blackham Resources at its remote Wiluna gold mine in Western Australia, around 1000 km north-east of Perth. The company initially installed four 1.75 MWe Cummins QSV91 gas gensets.

When additional power was required at Wiluna, it was essential that any new gas generator could run in parallel with the existing multi-turbo QSV91 units. Due to the mine's remote location, Blackham Resources needed a secure and reliable prime power supply to keep production up and running on a 24/7 basis. Contract Power Group chose Cummins as the preferred generator manufacturer to deliver the extra power and the HSK78G, rated at 2 MWe, was commissioned at the gold mine in January 2018.

"When we started talking with Cummins about installing the HSK78G at Wiluna, it was great to hear that this product could respond to extreme conditions while still offering high efficiency and good load transient capabilities across high temperatures," says Marc Grosser, general manager of Perth-based Contract Power Group.

"We are happy with the performance of the unit so far, as well as the accessibility of maintenance items. It is a compact unit and very well designed. Cummins has ensured there is fast service and support when called upon, despite our extremely remote location."

## Critical requirement.

The power station is 500 metres above sea level and operates in a harsh environment, with temperatures ranging from -2°C to 50°C across the year. As a result, the generator's ability to perform reliably in remote locations and extreme climates was a crucial requirement and a major consideration behind the decision to utilise the HSK78G.

**"We are positive it will be a robust product that will support our mining needs."**

With better transient capability (30% load step, four steps to load), the HSK78 maintains electrical efficiency performance within extreme environments. The generator series also automatically adjusts to changing ambient temperatures providing robust and reliable power, even with aggressive fuel types.

"The generator's ability to run efficiently at 45°C without de-rating, and generate 1,800 kWe even at 55°C, demonstrates its high ambient capability and suitability for this installation," says Marc Grosser.

He points out that long life to overhaul is another critical factor, and the fact the HSK78G has the industry's longest major overhaul service cycle of 80,000 hours is an important factor in terms of life cycle costs.

An automatic paralleling system was installed as part of the HSK78G generator package, requiring less tuning on site.

"Just like the Cummins QSK95 diesel generator set we installed and started trialling in 2014 at a remote minesite in Western Australia, we are looking forward to developing the HSK78 gas platform with Cummins and we are positive it will be a robust series that will support our mining needs," says Marc Grosser. ■