

Perkins unveils a new electronic engine specifically engineered for Indian power generation applications and built in India

The Indian prime and standby power generation markets present some unique challenges for diesel engine suppliers including high ambient temperatures and high altitudes. Developing a market-leading engine that excels in these environments to offer durable and reliable power with excellent performance was the challenge accepted by the Perkins team.

“The 4006 electronic engine is a significant addition to the globally known Perkins® 4000 Series range,” explained Tommy Quan, Perkins Asia sales director. “Designed for the growing infrastructure industry in India, it builds on Perkins commitment to India by offering market leading performance and reduces cost of ownership at the same time.”

The new 6-cylinder, 23 litre 4006 electronic engine is rated at 750 kVA prime. It offers outstanding power density, simplified service requirements, world-class load acceptance and the ability to operate over a broad range of ambient temperatures and altitudes, all of which are important needs of the Indian power generation market. It is built on the core of Perkins 4000 Series engines currently manufactured at Aurangabad with substantial improvements to many of that engine’s features.

A re-designed cylinder head benefits from changes in both materials and geometries that result in a tappet setting interval of 2,000 hours to reduce maintenance costs. The valves use new alloys in optimised designs and geometries to improve performance and extend their service life, resulting in a cylinder head top end overhaul period of 15,000 hours.

“Another step to improve uptime is through reducing engine oil consumption to minimise oil top up frequency,” Tommy added. “We addressed it with a new piston ring pack for the 4006 electronic that cuts oil consumption up to half. That’s another big reduction in operating and maintenance costs that impacts the overall cost of ownership for end users.”

4006 electronic engine

Technical article

While improved mechanical designs and components are important, the fact that the 4006 electronic engine is electronically controlled is the most significant change Perkins made to the product. Among the many benefits of this technology is a reduction in specific fuel consumption of up to seven percent, resulting directly from the use of electronically controlled fuel injectors.

Precision electronic fuel injection is a major reason behind the 4006 electronic engine being able to meet the stringent Indian CPCB-II emissions standards while delivering performance at the same time. Electronically controlled fuel injection allows independent injection timing and injection pressure control through twin electronic solenoid coils, giving the capability to deliver multiple injection events as required.

The 4006 electronic is capable of delivering up to 750 kVA prime power. This power can be delivered within two load steps with the first step being at 450 kVA. This equates to a 60 percent first load step that is a critical requirement for prime and standby applications.

“Not only does the 4006 electronic deliver more power, quicker,” Tommy noted, “but it does so under extreme altitude and ambient temperature conditions. Improved fuel control allows the 750 kVA 4006 electronic to deliver its full output in 50°C ambient temperatures at 300 metres above sea level with no de-rating.”

The benefits of an electronically controlled engine extend well beyond fuel economy, emissions and performance. The Electronic Control Module (ECM), for example, can monitor fuel filter performance allowing users to change filters only when actually needed instead of on an arbitrary time-based schedule adding to the cost saving.

The 4006 electronic control system is compatible with the standard Perkins electronic diagnostic tool used to improve the speed and accuracy with which engine issues are resolved. The ECM's control and data collection capabilities also open the possibility of integrating the 4006 electronic with other generator set monitoring systems that may be implemented by the generator set manufacturer. Taken together the mechanical improvements and electronic controls make the 4006 electronic engine an extremely efficient and power dense package.

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The engine delivers equivalent performance in a 6- cylinder, 23 litre configuration to competitive 12-cylinder, 38 litre engines which gives users a number of significant advantages.

The physically smaller engine reduces packaging costs and has a more compact footprint which allows it to be used in smaller canopies which have a much smaller footprint as compared to other similar engines in the market. This offers a key benefit in large metro cities where space saving is a critical requirement.

Perkins manufactures the 4006 electronic engine at its Aurangabad plant. Completed in 2015, the Aurangabad plant has the capacity to produce up to 3,000 engines per year. Aurangabad is one of two Perkins plants in India. The other, at Hosur produces Perkins® 1100 and 2000 Series engines.

“Low cost of ownership, world-class load acceptance and ambient de-rating capabilities and the highest power density available at 750 kVA make the 4006 electronic an ideal choice for Indian power generation customers,” said Pankaj Jha, Perkins general sales manager – South Asia. “And why not? After all the engine was specifically engineered for the Indian market and it’s built right here in Aurangabad.”

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