VOLVO PENTA

THE HEART THAT NEVER STOPS

Introducing powerful new 16-liter power generation engines

New market-leading engines expand our power generation range

Like the heart that never stops, each and every day, Volvo Penta's engines are hard at work delivering power to people's everyday lives and functions which are critical to society.

With the introduction of two new 16-liter engines, Volvo Penta is expanding our global power generation range to deliver a market-leading offer. Thanks to the addition of our latest models, TWD1645GE and TWD1644GE, we can now deliver power output from 85 kVA up to 800 kVA.

It is an exciting move for us to launch two new engines for the power generation segment. We have taken a significant step forward, delivering approximately a 10% increase in power compared to our previous 16-liter engine, the TWD1643GE.

The all-new TWD1645GE offers up to 800 kVA at 1800 rpm, and up to 770 kVA at 1500 rpm. We have developed an engine that is best in class when it comes to power density within the 16-liter category. It comes equipped with our latest features, which enable us to deliver the most power per liter displacement of any 16-liter engine on the market.

A sister model, the new TWD1644GE is another exciting addition to Volvo Penta's competitive line-up, producing up to 752 kVA at 1800 rpm and 717 kVA at 1500 rpm. This further enhances our strong engine family within the power generation segment.

Both new engines are part of the same engine family as our existing power generation range. This means they have the same, common engine base as the rest of our 16-liter engine family, which is well-known by our customers. Thanks to the introduction of new features, we have been able to expand our power offer, while taking advantage of the same engine base.

From a power output of 500 kVA to 800 kVA, all products in the range have the same engine footprint. This introduces elements of simplicity and flexibility.

One benefit for our existing customers is that they will be able to work in basically the same envelope from an installation and overall footprint perspective. This makes it easy to install engines from across the range, which are also easy to operate and maintain.

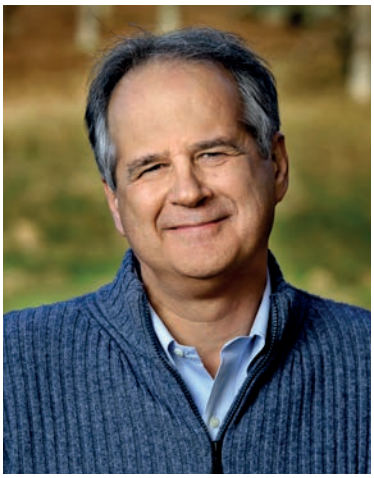
Market-leading key features of both new engines include new high-grade steel pistons, dual stage turbo chargers, electronic high-pressure injectors, an upgraded wiring harness, the latest advanced engine control system, and a two circuit cooling package. Additionally, the engines' compact size results in an optimized engine canopy.

All these features add up to market-leading power, which is based on proven technology and a premium quality product.

We anticipate that our customers will be as excited about these new engines as we are. The power density of our product offer in this category is fantastic. We are looking forward to addressing an even wider range of demand.

I hope you enjoy discovering more about our new power generation engines.

Giorgio Paris



Giorgio Paris
Head of the Industrial Engine Segment for Volvo Penta

CONTENT

Khonaysser Motors produces gensets for industrial customers in the Middle East

The ultimate test

Lebanese company Khonaysser Motors has been working with Volvo Penta for more than 20 years, buying the company's engines and creating gensets.

The Beirut-based OEM was established in 1960, initially to service diesel engines and trucks, but has expanded its operations significantly over the decades; it is now an official importer of Volvo Penta engines and a leading manufacturer of gensets for the industrial and marine markets, both in Lebanon and for export to other Middle Eastern countries.

"Khonaysser is extremely important to us and we've established a good relationship," says Hans Andersson, Volvo Penta's sales and marketing manager for the industrial segment in the Middle East. "They are a good customer and the collaboration works by discussing the ways in which we can provide the best options between us, for their customers. The Middle East is one of the biggest markets for gensets, and our engines are of premium quality, so we can offer excellent solutions for the end users. They are also very good at aftermarket care and we share those values of providing the best service for customers."

Premier partnership

As a major engine importer and OEM, Khonaysser Motors is in a prime position to be one of the first companies to use Volvo Penta's new TWD1645GE engine to create a new genset.

"We have worked hand in hand for many years to ensure that we can supply premium products, a real competitive edge, and good aftermarket support", says Antoine Khonaysser, owner of Khonaysser Motors. "Volvo Penta is very customer focused and their staff are eager to support us based on the input and feedback we provide.

"We have a very good co-operation which serves our mutual goals, and we both want to grow continuously in the Middle Eastern market. We are looking forward to increasing sales with the high output that the new engine provides."

Proven quality, higher performance

Volvo Penta's new TWD1645GE provides the highest power density in the 16-liter diesel engine class, and is accompanied by a sister model, the TWD1644GE; together they extend the range of power generation engines. They offer proven quality with the same engine base as previous models but with more power leveraged for optimum performance. They are built to perform in harsh environments for heavy duty usage, and are compact with easy installation and an optimized engine canopy. Their economic fuel consumption provides low total cost of ownership, and they are equivalent to EU Stage II Emission levels. In addition, they provide a smooth operation with low noise and minimal vibration.

"Volvo Penta engines have always been reliable, easy to maintain and are suitable for heavy duty use," says Ronald Youakimian, technical consultant at Khonaysser Motors. "One of the things we like about this new engine by Volvo Penta is that its emissions are equivalent to Stage II so even though we don't have the requirement by law, it makes it much better for us here."

He adds: "All of our Volvo Penta customers are addicted to the products and because of this we have a lot of queries for bigger sized gensets. With the new engine, we will be able to fulfil those requirements."

Khonaysser Motors has tasked two loyal long-standing customers in very different but equally demanding applications, to field test the gensets to unearth the TWD1645GE engine's maximum potential. One customer, Ishtirak El Hassan, uses gensets to supply backup power to Lebanon's unreliable national grid; another customer, 53dots, is a Beirut-based printing company that relies solely on gensets to keep the business running.

Khonaysser Motors has been working with Volvo Penta for more than 20 years

"We're keen to see how these gensets are going to perform in different situations," adds Youakimian. "What will make things interesting is that conditions here are hot in summer, up to 40 degrees Celsius, and it's dusty in many locations. This will really put the engines to the ultimate test."

The gensets, with Volvo Penta engines, are housed in a canopy for protection against dust and rain, and for soundproofing

Power to keep the country running

Lebanon has an extremely unstable national power supply with an average of 12 hours of outages per day. Without a backup power supply in place, daily life would be extremely difficult for Lebanese people.

Electricity supply company Ishtirak El Hassan is helping to keep the country running. The family-run business uses gensets to supply power to small companies, shops, offices and homes when the national grid fails.

"During these outages, our gensets supply the power to ensure a constant supply to end users," says the company's owner, Ali Soufan. "They need to be ready at all times as the main power outages are not predictable."

Since 2014, it has been using 12 gensets powered by previous models of Volvo Penta engines. The engines are located near roads and landfill sites, and are housed in canopies to protect them from dust and rain, and for soundproofing to prevent noise pollution.

Increasing demand requires increased performance

The previous models have served Ishtirak El Hassan well, but to keep up with the ever-increasing demand, the company required an engine with an even higher output. The company opted to test Khonaysser Motors' prototype genset powered by Volvo Penta's new TWD1645GE engine to see if it is up to the task. The performance of the unit is of prime importance and this can be achieved by the 16-liter engine providing the highest power density in its class. And with a high power output being required immediately and constantly, the genset is being put through its paces for testing of load acceptance.

"We are looking for a higher output of genset for our business," adds Soufan. "The gensets need to operate seven days a week, and must reliably work for more than 6,500 hours per year. In the case of major grid problems, they need to provide power for up to 48 hours continuously."

Volvo Penta's proven manufacturing expertise along with new the technology and upgraded features of the TWD1645GE, create an engine with excellent fuel efficiency; consequently, the engine offers a low total cost of ownership.

"Field testing is vitally important," says Soufan. "We will get more familiar with the new genset and prepare ourselves for a final version that we might purchase in future. We will only invest in a product after thorough investigation and care, but the first impression we have of the new unit is really good."

Ishtirak El Hassan provides electricity to homes and businesses in Lebanon

The gensets need to operate seven days a week

53dots is a leading printing company in Lebanon

Meeting the challenge

Situated on the outskirts of Lebanon's capital city is one of the country's leading printing companies, 53dots. The Beirut-based company was founded in 1953 and produces a range of printed materials, from hard-back books and glossy magazines to commercial businesses reports and even food packaging. It manages to uphold its prestigious position in the market despite one major challenge: there is no main electricity source where it is located.

For many companies, the thought of setting up a business where there is no power would seem an impossible feat. But 53dots has overcome this obstacle by relying solely on gensets to keep the business running.

"Buying a genset is a kind of partnership," says 53dots owner and CEO, Wael Jamaleddine. "The cost of ownership and power production, as well as the aftermarket service, are all very important. We need qualified servicing and the easy availability of spare parts to maintain good uptime."

Relying on the best equipment

53dots is open six days a week, achieving a total of more than 3000 working hours a year. As well as operating several types of industrial printing units, the company uses machines for binding, saddle-stitching, collating, folding and packaging the various printed materials. As such, 53dots requires reliable, high performance gensets that can power its factory easily and efficiently.

Compact gensets which are easy to maintain for reduced downtime, and which provide smooth operation with low noise and minimal vibration, are a requirement. And economic fuel costs and low emissions from the Stage II equivalent engine are also beneficial for the company, given that it needs gensets as its prime power source.

Jamaleddine has been happy to test out Volvo Penta's new TWD1645GE engine in the Khonaysser Motors genset.

"We understand that in order to provide high quality packaging and printing services, 53dots must use only the best production equipment," adds Jamaleddine. "Therefore, we have re-invested in our staff as well as our printing technology, and use only the newest facilities, printing, and folding machines.

"We rely on these Volvo Penta engines to power our business, and we rely on Khonaysser Motors for the aftermarket care."

Antoine Khonaysser, left, owner of Khonaysser Motors, with Wael Jamaleddine, right, owner of 53dots

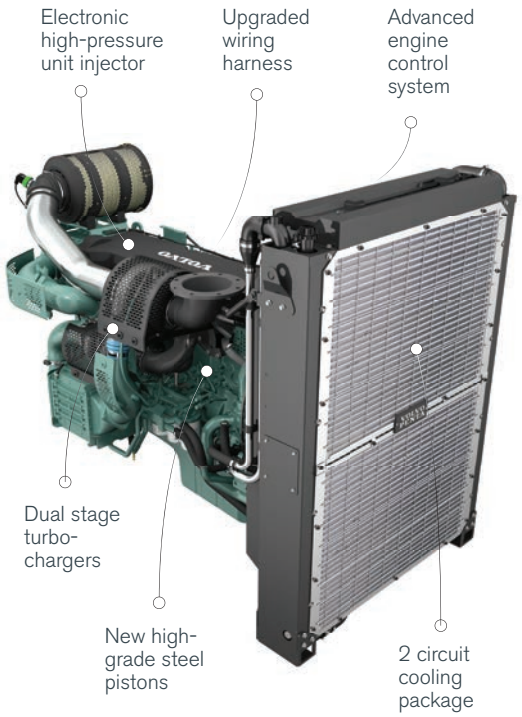
A compact engine with a powerful punch

Volvo Penta's new 16-liter engine models, TWD1645GE and TWD1644GE, include the latest features designed to provide the highest power output, while maintaining the same base engine as the rest of the 16-liter engine family. The end result is a compact engine that delivers a powerful punch.

Both new engines utilize dual-stage turbochargers and heavy-duty steel pistons to provide excellent power density. They feature proven combustion technology with high-pressure unit injectors, resulting in high fuel efficiency and low exhaust emission levels.

The engines also feature a compact and low weight design that is well-balanced, providing smooth operation with low noise and vibration. Additionally, both engines are designed for easily accessible service points.

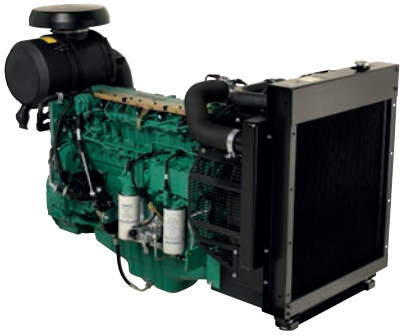
Key features and specifications



	50 Hz/1500 rpm						60 Hz/1800 rpm						
	PRIME POWER			STANDBY			PRIME POWER			STANDBY			GENERATOR EFF.
Engine	kWm	kWe	kVA	kWm	kWe	kVA	kWm	kWe	kVA	kWm	kWe	kVA	(%)
TWD1644GE	555	521	652	610	573	717	582	547	684	640	602	752	94%
TWD1645GE	595	560	700	655	616	770	619	582	727	681	640	800	94%

A competitive power generation range

We've expanded our competitive range of power generation engines to address an even broader reach.



Across the range, our power generation engines are designed for the most demanding needs thinkable. Prime or standby power – where and when it's most needed.

Easy installation

Our engines are designed for easy installation – regardless of whether you are an equipment manufacturer or an operator.

Easy to service and support

Securing maximum uptime is the first priority. Service points on all our power generation engines are positioned for easy access.

Flexible – with a global footprint

A common platform across our power generation range makes it easy to install, maintain and operate engines from across the range. The platform commonality between Volvo Penta engines also results in increased parts availability and shorter lead times.

Proven technology

As part of the Volvo Group, we are able to develop an engine range for variety of power generation needs – reliable and durable engines, based on proven technology. For example, when we first introduced our D13, more than 150,000 D13 engines had already been proven in different Volvo Group applications.

THE POWER OF INDEPENDENCE

85-800 KVA

Volvo Penta is one of the world's biggest independent suppliers of engines for power generation. It is our business to build and support engines that make the most of any OEM's genset design – a range of reliable, fuel-efficient diesel engines that meet a wide span of specific demands. Mobile or stationary. 24/7 or standby. In any climate: freezing or scorching, dry or wet, in deep shafts or at high altitudes. Tell us your needs and we'll show you the engine. **www.volvopenta.com/industrial**

VOLVO PENTA