VM 32 E

Efficiency and Performance
New Product Development with Modular Design

12 • 16 Cylinder
The new VM 32 E engine is designed for our offshore customers seeking the greatest reliability and durability in combination with stability at high power output.

The VM 32 E engine extends the output range of our recently announced M 32 E inline engine above 5 MW and stands out with the same superior serviceability and long maintenance intervals. Additional properties of the VM 32 E are a power output of 560 kW/cylinder, 100% PTO capability and a large portfolio of application-driven options. The VM 32 E is available as a generator set with a new “flexibly-mounted engine on base frame” design and a wet oil sump solution with resilient mounting for both propulsion engines and generator set applications without base frame. An optional Part Load Optimization Kit (PLK) for constant speed applications reduces fuel consumption at part load for customers who often operate in DP2/DP3 mode.

The VM 32 E has an improved power to weight ratio, is the best solution for engine rooms that occupy fewer frames and is SCR ready for the new Cat® SCR System to fulfill IMO III exhaust gas emissions.

Please find further information about our IMO III solutions in our Cat SCR System leaflet.
Power Take Off (PTO)

For more complex engine room layouts, we offer a 100% PTO option. On the 12 M 32 E we offer 6,720 kW and on the 16 M 32 E 8,960 kW of power take off on the counter flywheel side. Generator and propulsion systems driven by the same engine offer significantly higher flexibility with a fewer number of engines.

Benefits:
- Reliable and durable engine
- 12 M 32 E power uprated to 6,720 kW
- 16 M 32 E power uprated to 8,960 kW
- Improved power to weight ratio
- Available as generator set with new base frame design
- Available as propulsion engine with dry or wet oil sump
- 100% PTO capability available
- Part Load Optimization Kit (PLK) for low load operation available (optional)
- Simple and efficient engine concept with reliable mechanical injection system and maintenance friendly turbocharger

Please find more information about Caterpillar Propulsion products on our website www.catpropulsion.com
Wet Oil Sump Design with Resilient Mounting
Propulsion and Diesel Electric Application

Wet oil sump with resilient mounting

We developed a wet oil lubricating system to reduce wet engine weight, engine height, and make the installation of the engine as simple as possible. State of the art marine lube oil systems include a dry lube oil pan, a mechanical lube oil supply pump, and a lube oil storage tank below the engine. With our wet oil lubrication system, we offer a solution with a reduced scope of supply but without disadvantages.

The dry oil pan and lube oil storage tank are housed in the wet lube oil pan. The installation is easier and the height of the engine and lube oil system as well as the lube oil volume itself is reduced. The resilient mounting of the wet oil pan concept reduces transfer of engine vibration into the ship and last but not least helps the crew sleep well during their off shift while the engine is running.

Benefits:
- Simple installation
- Reduced height
- Fewer components
- About 30% reduced lube oil volume
- Proven combination of wet oil sump and resilient mounting
Flexibly mounted engine on base frame

To make the generator set installation as easy as possible, and to reduce height, weight and dampen vibration from the engine, Caterpillar Motoren developed a new base frame. In this design the engine is resiliently mounted on the base frame with conical mounts. The base frame itself is reduced in weight and height to make transport and handling during the installation phase easier. Last but not least the ship’s weight and design will benefit from the lower weight and the smaller dimensions of its entire lifetime, especially on smaller ship application. The generator is mounted on non-resilient adjustable spacers which is the most economical way to establish a perfect mounting plane and allows an easy realignment of the generator if the conical mounts of the engine set during their lifetime. As with the wet oil sump, the reduced vibration levels will help the crew sleep well during their off shift while the engine is running.

Benefits:

- Transport and handling simplified
- Quick and easy installation
- Minimal transfer of engine vibration to the ship and generator
- Crew friendly
- Extended generator set lifetime
- Reduced height
- Reduced weight
- Easy realignment of generator
VM 32 E • Part Load Optimization

Specific fuel oil consumption – VM 32 E – IMO II – with 560 kW/cyl. at 720 and 750 rpm
ISO 3046/1 and LCV 42.7 MJ/kg, 5% tolerance

- per engine driven lube oil pump
  - power
    - 100% 85% 75% 50% 25%
  - add. sfoc const. speed
    - 1.0% 1.2% 1.3% 2.0% 4.0%
  - add. sfoc prop. curve
    - 1.0% 1.1% 1.2% 1.4% 2.0%

- per engine driven cooling water pump
  - power
    - 100% 85% 75% 50% 25%
  - add. sfoc const. speed
    - 0.4% 0.47% 0.53% 0.8% 1.6%
  - add. sfoc prop. curve
    - 0.4% 0.4% 0.4% 0.4% 0.4%

Up to 10 g/kWh fuel savings, 3 x 33% load step capability and reduced smoke emissions are the benefits of the Part Load Optimization Kits (PLK) for constant and variable speed operation. They are attractive for all customers operating their prime movers mainly between 10% and 70% load. Both Part Load Kits include our proven Flexible Camshaft Technology, special turbocharger matching and an intelligent control software logically connected to the Large Engine Safety System (LESS).

### Maximum continuous rating per ISO 3046/1

<table>
<thead>
<tr>
<th></th>
<th>VM 32 E Standard</th>
<th>VM 32 E Part Load Optimization constant speed</th>
<th>VM 32 E Part Load Optimization variable speed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speed</strong></td>
<td>kW/cyl.</td>
<td>560</td>
<td>560</td>
</tr>
<tr>
<td>Brake mean effective pressure (BMEP)</td>
<td>rpm</td>
<td>720/750</td>
<td>720/750</td>
</tr>
<tr>
<td>Specific fuel oil consumption</td>
<td>bar</td>
<td>25.2/24.2</td>
<td>25.2/24.2</td>
</tr>
<tr>
<td>n = const 75 %</td>
<td>g/kWh</td>
<td>180</td>
<td>182</td>
</tr>
<tr>
<td>50 %</td>
<td>g/kWh</td>
<td>188</td>
<td>183</td>
</tr>
<tr>
<td>35 %</td>
<td>g/kWh</td>
<td>200</td>
<td>194</td>
</tr>
<tr>
<td>25 %</td>
<td>g/kWh</td>
<td>218</td>
<td>211</td>
</tr>
</tbody>
</table>

All values for information only.
VM 32 E • Technical Data

■ Propulsion and diesel electric application • Turbocharger at free end

Removal of cylinder liner in transverse direction \( Y_1 = 2,836 \text{ mm} \).
Minimum engine center spacing: 3,500 mm (two engines side by side).

<table>
<thead>
<tr>
<th>Engine</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>L3 (mm)</th>
<th>H1 (mm)</th>
<th>H2 (mm)</th>
<th>H3 (mm)</th>
<th>W1 (mm)</th>
<th>W2 (mm)</th>
<th>Weight (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 M 32 E</td>
<td>6,956</td>
<td>5,535</td>
<td>949</td>
<td>2,319</td>
<td>1,205</td>
<td>750</td>
<td>2,985</td>
<td>1,133</td>
<td>65.0</td>
</tr>
<tr>
<td>16 M 32 E</td>
<td>8,328</td>
<td>6,885</td>
<td>949</td>
<td>2,319</td>
<td>1,205</td>
<td>750</td>
<td>2,985</td>
<td>1,133</td>
<td>82.0</td>
</tr>
</tbody>
</table>

■ Generator set application • Turbocharger at free end

Removal of cylinder liner in transverse direction \( Y_1 = 5,156 \text{ mm} \).
Reduced removal height with special tools only.
Minimum engine center spacing: 3,500 mm (two gensets side by side).
Prime mover and generator are always flexibly coupled.

<table>
<thead>
<tr>
<th>Engine</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>H1 (mm)</th>
<th>H2 (mm)</th>
<th>W1 (mm)</th>
<th>W2 (mm)</th>
<th>Dry Weight* (t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 M 32 E</td>
<td>10,703</td>
<td>9,484</td>
<td>2,319</td>
<td>2,320</td>
<td>3,526</td>
<td>1,133</td>
<td>120.0</td>
</tr>
<tr>
<td>16 M 32 E</td>
<td>12,149</td>
<td>10,930</td>
<td>2,319</td>
<td>2,320</td>
<td>3,526</td>
<td>1,133</td>
<td>140.0</td>
</tr>
</tbody>
</table>

* depending on generator weight
The Power You Need.

The Cat® and MaK brands of Caterpillar Marine offer premier high- and medium-speed propulsion, auxiliary, and generator set solutions, as well as optional dual fuel, diesel-electric, and hybrid system configurations. With the launch of Caterpillar Propulsion our comprehensive and evolving product line gives customers one source for the most extensive engine power range available, complete propulsion systems, controllable pitch propellers, transverse and azimuth thrusters, and controls. Cat and MaK products and technologies are proven reliable and are built to last in all marine applications, demonstrating superior productivity and the lowest lifecycle cost.

The Cat Global Dealer Network, more than 2,200 global service locations strong, ensures that you’ll have local expertise, highly-trained technicians, rapid parts delivery, and the proper equipment and services to keep you working – anytime, anywhere.

Construction, term, or repower financing through Cat Financial helps you make Cat and MaK power a reality. With our knowledge of customer needs, local markets, and legal and regulatory requirements, we’ve been providing tailored financing solutions and exceeding expectations since our start in 1986.

For more information and to find your local dealer, please visit our website: [www.cat.com/marine](http://www.cat.com/marine)