OFFSHORE VIBRATORY HAMMERS
PRODUCT RANGE

DIESEKO GROUP
The Dieseko Group, which was established in 1974, is a manufacturer of a wide range of products for the foundation industry. The range is divided into five product lines: vibratory hammers and impact hammers, piling and drilling rigs, soil improvement equipment, dredging equipment and hydraulic power units.

Dieseko Group is owner of the brands PVE Piling & Vibro Equipment, ICE International Construction Equipment and Woltman Piling & Drilling Rigs. Dieseko Group also supplies Bell Dredging equipment.

Dieseko Group engineers develop foundation equipment in accordance with the latest regulations. The experienced engineers in the sales and rental department have a profound knowledge of the equipment and are always standing by to advise clients on their specific needs. Spare parts are in stock for all machines, which can be shipped quickly to dealers and clients worldwide, to avoid downtime on projects. Service engineers are available 24/7 to support clients on site. With over 60 dealers and branches worldwide, Dieseko Group is a reliable partner for all foundation contractors for consultation, sales, rental and financing.
PVE OFFSHORE VIBRATORY EQUIPMENT

APPLICATIONS
• Heavy duty steel driving and extraction projects
• Decommissioning of offshore structures
• Highly efficient for driving XL monopiles

ADVANTAGES
• Significant time saving, upending option/self handling/pitching option
• Reduction of noise pollution (less than 140 dB)
• Less pile fatigue resulting in cost efficient pile design and longer lifetime of structures
• More accurate positioning
• Correction during driving is possible

EQUIPMENT
• Excellent quality
• Forced lubrication system
• Cooling system
• Wide range of clamping solutions
• Silent power packs
  - Open loop hydraulic system
  - Advanced iQan intelligence and control
  - Tier/Stage 2 to 4-Final compliant
  - Suitable for driving other hydraulic equipment
• Equipment is offshore certified (DNV 2.7.1 or equivalent)

DIESEKO GROUP
• Over 40 years of experience with a proven track record
• Consultancy and R&D to ensure the best solution for your project
• Sustainable technology reduces your carbon footprint
• 24/7 worldwide support
• Large spare parts inventory
• Largest rental fleet in the world
• ISO 9001 certified, FPAL registered, IRO member
PVE VIBRATORY HAMMERS FOR:

- Initiation/Start-up piles
- Jacket installation
- PLEM installation
- Conductor installation
- Anchor piles
- Pipe support piles
- Extraction of followers
- Decommissioning of offshore structures
Dieseko Group has a long track record of installing piles in the North Sea for the oil and gas sector. Since the late 1980s, our vibratory hammers have been used on numerous projects. Based on our experiences we design, test and produce equipment to serve the highly demanding offshore oil and gas sector worldwide.

ADVICE AND ENGINEERING
PVE offers a wide range of tailor-made solutions and new products demonstrate our engineering capabilities and achievements. Deck layout options and handling activities can be discussed during the early project stages in order to determine most efficient arrangements. Our engineering team is available to investigate new technical and business opportunities and to advise our customers on project specific requirements.

PILE VERTICALITY MONITORING
Real-time monitoring of pile inclination is an important feature of our total solution. Our system is extensively proven and tested to be a reliable monitoring device.

DECOMMISSIONING OF OFFSHORE STRUCTURES
Our vibratory hammers can extract the entire foundation, without leaving debris on the seabed.
Our innovations are driven by our customers needs and our desire to provide solutions with tangible benefits. Two major breakthrough, patented, PVE innovations are:

**COUPLING GEARBOXES**
PVE has developed a patented synchronization module that enables you to couple two PVE GIANT gearboxes.

- Double the power
- Deployment of single and double gearboxes
- Unique multi-usage vibratory equipment with only one suppressor

**UPENDING AND DRIVING IN ONE SEQUENCE**
One of our most innovative solutions is the upending vibratory hammer. Due to tilting the vibratory hammer is able to clamp onto horizontally stored piles and drive them vertically without any other handling operations.

- Highly efficient
- Huge time savings, thus cost savings
- Unique multi-usage vibratory equipment

This development originates from the offshore industry and has now been adopted for onshore applications. For this purpose, Dieseko Group has developed an add-on upending mechanism. It is fully hydraulic and can be adjusted to suit the various types of Dieseko Group vibratory hammers.
RWE TEST PVE 500M: FAST AND QUIETER

Vibratory piling is up to ten times faster and quieter compared to impact hammering. That is the most important outcome of a series of independent tests carried out by RWE Innogy, Bilfinger Offshore, DONG Energy, EnBW, E.ON and Vattenfall. Industry partners decided to do a full scale test in Cuxhaven, where three pairs of vibro driven and impact driven piles (diameter 4.3 m, length 21.5 m, wall thickness 40-45 mm, weight 92 tonnes) were installed to a depth of 18.5 m in order to compare their behaviour under lateral load.

The tests, which were carried out with our PVE 500M, show that the vibratory installation method has a major beneficial impact on the lateral load-bearing capacity of piles. That is why we are working hard to convince utilities, contractors and certifying bodies to use vibratory hammers as an alternative solution to impact hammer driving. The test results show that our PVE vibratory hammers are a cost effective solution with less handling time and installing monopiles faster. The penetration speed of the pile exceeded all expectations.
XXL MONOPOLES

New designs show that future XXL monopiles will have a diameter of 10 metres. Our hammers are designed to handle even the largest monopiles and, therefore, meet the future standard. The newly designed PVE Giant can lift up to 800 tonnes and drive with an eccentric moment of up to 2000 kgm. PVE designed for this modular concept the patented coupling and synchronization of gearboxes.
TIME SAVING AND ENVIRONMENTALLY FRIENDLY

PVE offshore vibro technology is highly efficient. Our vibratory hammers offer minimal noise emission levels for a reduced impact to sea life and the environment. With a specialised R&D department and a long-term relationship with geotechnical specialists, we are able to provide the competitive edge.

To meet the demands and expectations of our offshore customers, we have developed specific equipment that reduces the driving time as well as handling time. A striking example is our patented upending PVE 300MU vibratory hammer.

**PVE 300MU (UPENDING)**

In the offshore wind market, saving time is gaining money as the total project time decreases. The PVE 300MU upending vibratory hammer moves horizontally stored piles into the vertical position. Thus they are lifted, positioned and vibrated in one sequence.

**PVE 250M / 500M**

The gearbox of the GIANT series, with a lifting head, creates a monobloc vibratory hammer up to 500 kgm. These mean machines have already proved themselves in the biggest piling jobs.

**PVE 2000M GIANT**

The PVE 2000M Giant can drive and extract large diameter XXL monopiles.

**DECOMMISSIONING MET MASTS**

The decommissioning of met masts is necessary in an increasing number of projects. Our vibratory hammers can extract the entire met mast foundation, without leaving debris on the seabed.
VIBRO PILE DRIVABILITY PREDICTION AND POST PILING ANALYSIS

Dieseko Group works with reputable third parties to undertake vibro pile drivability predictions. After piling our measuring equipment - which can record amplitude, acceleration, centrifugal force and hydraulic pressure - is examined a post piling report can be supplied upon request. This enables us, geotechnical experts and the industry in general, to benefit from our experience on numerous projects onshore and offshore.

CARBON FOOTPRINT

Sustainability is embedded in our R&D, processes and products. Vibrating is an environmentally friendly foundation technique, as vibrations cause minimal noise and ground disturbance. PVE equipment is developed and produced according to the latest regulations. Together we can minimise your carbon footprint.

CERTIFICATION

All our equipment is offshore certified (DNV 2.7.1 or equivalent) including auxiliary equipment.

QHSE is KEY in the offshore sector and Dieseko Group recognises the importance of this. We have the FPAL certification and work following ISO 9001 standards.
# Product Range

## Vibratory Hammers

The PVE M-series hydraulic vibratory hammers provide excellent performance and precision and are built to be extremely robust. This M-series is developed for driving heavy and starts at 110 kgm eccentric moment up to 2000 kgm.

## Rental Fleet

Do you need to be fully operational on site within a few days? Dieseko Group offers a wide range of offshore vibratory hammers for rent which are suitable for small and big projects. The machines have a centrifugal force from 1000 to a gigantic 44000 kN and are operated by certified staff.

### Normal Frequency Vibratory Hammers

<table>
<thead>
<tr>
<th></th>
<th>110M</th>
<th>130M</th>
<th>150M</th>
<th>170M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eccentric moment (kgm)</td>
<td>110</td>
<td>130</td>
<td>150</td>
<td>170</td>
</tr>
<tr>
<td>Max. centrifugal force (kN)</td>
<td>2198</td>
<td>2794</td>
<td>3224</td>
<td>3654</td>
</tr>
<tr>
<td>Max. frequency (rpm)</td>
<td>1350</td>
<td>1400</td>
<td>1400</td>
<td>1400</td>
</tr>
<tr>
<td>Max. amplitude (*) (mm)</td>
<td>31</td>
<td>23</td>
<td>26</td>
<td>30</td>
</tr>
<tr>
<td>Max. static line pull (kN)</td>
<td>1200</td>
<td>1260</td>
<td>1260</td>
<td>1260</td>
</tr>
<tr>
<td>Max. oil flow (L/min)</td>
<td>956</td>
<td>1293</td>
<td>1293</td>
<td>1293</td>
</tr>
<tr>
<td>Dynamic weight (*) (kg)</td>
<td>7000</td>
<td>11320</td>
<td>11400</td>
<td>11455</td>
</tr>
<tr>
<td>Total weight (*) (kg)</td>
<td>12000</td>
<td>17000</td>
<td>17780</td>
<td>17850</td>
</tr>
<tr>
<td>L x W x H (*) (mm)</td>
<td>3235 x 1088 x 2565</td>
<td>3862 x 1217 x 2425</td>
<td>3862 x 1217 x 2425</td>
<td>3862 x 1217 x 2425</td>
</tr>
</tbody>
</table>

Recommended power pack: 1000, 1400, 1400, 1400
Recommended Sheet pile clamp: 350TU, 350TU, - , -
Recommended Tube clamp set: 150TC, 175TC, 200TC, 350TC

### Rental Fleet

<table>
<thead>
<tr>
<th></th>
<th>200M</th>
<th>250M</th>
<th>300M</th>
<th>500M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eccentric moment (kgm)</td>
<td>200</td>
<td>250</td>
<td>286</td>
<td>500</td>
</tr>
<tr>
<td>Max. centrifugal force (kN)</td>
<td>4300</td>
<td>5374</td>
<td>6150</td>
<td>10748</td>
</tr>
<tr>
<td>Max. frequency (rpm)</td>
<td>1400</td>
<td>1400</td>
<td>1400</td>
<td>1400</td>
</tr>
<tr>
<td>Max. amplitude (*) (mm)</td>
<td>19</td>
<td>32</td>
<td>21</td>
<td>33</td>
</tr>
<tr>
<td>Max. static line pull (kN)</td>
<td>1800</td>
<td>2270</td>
<td>4000</td>
<td>2270</td>
</tr>
<tr>
<td>Max. oil flow (L/min)</td>
<td>1680</td>
<td>1600</td>
<td>3200</td>
<td>2600</td>
</tr>
<tr>
<td>Dynamic weight (*) (kg)</td>
<td>21000</td>
<td>15820</td>
<td>27250</td>
<td>30300</td>
</tr>
<tr>
<td>Total weight (*) (kg)</td>
<td>30000</td>
<td>25250</td>
<td>47000</td>
<td>38200</td>
</tr>
<tr>
<td>L x W x H (*) (mm)</td>
<td>3856 x 1600 x 3295</td>
<td>5122 x 1217 x 2335</td>
<td>5035 x 1800 x 4395</td>
<td>5122 x 1217 x 3390</td>
</tr>
</tbody>
</table>

Recommended power pack: 1600, 1600, 3200, 3200
Recommended Sheet pile clamp: - , - , - , -
Recommended Tube clamp set: 150TC, 350TC, 210TC, 350TC

*) = excluding clamp & hoses
**PRODUCT RANGE CLAMPS**

PVE has developed a wide range of heavy duty clamping systems, beams and cross beams for driving piles. Our experts are on hand to offer advice on the best clamping solutions for your application.

- **TU series:** sheets pile clamps for single or double sheets, H-beams, anchors
- **TC series:** tube clamps for tubes or multiple sheets

### SHEET PILE CLAMPS

<table>
<thead>
<tr>
<th></th>
<th>200TUP</th>
<th>350TU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping force</td>
<td>kN</td>
<td></td>
</tr>
<tr>
<td>Working pressure</td>
<td>bar</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>L x W x H</td>
<td>mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>200TUP</th>
<th>350TU</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping force</td>
<td>kN</td>
<td></td>
</tr>
<tr>
<td>Working pressure</td>
<td>bar</td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td></td>
</tr>
<tr>
<td>L x W x H</td>
<td>mm</td>
<td></td>
</tr>
</tbody>
</table>

### TUBE CLAMP SETS

<table>
<thead>
<tr>
<th></th>
<th>150TC</th>
<th>175TC</th>
<th>200TC</th>
<th>210TC</th>
<th>350TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clamping force</td>
<td>kN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working pressure</td>
<td>bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L x W x H</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. inside tube Ø</td>
<td>mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
VERSATILE POWER

PVE offshore power packs are driven by top brand engines and pumps. The available engines range from Tier 2 to durable Tier 4 final, so we are able to offer a solution for each geographic region and requirement.

Intelligent iQan motor management software controls the engines and special features such as GPRS tracking and remote monitoring are available. The main benefit of the PVE open loop power pack system is that the risk of overheating is greatly reduced.

POWER PACKS

<table>
<thead>
<tr>
<th>1000</th>
<th>1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel engine</td>
<td>Volvo TAD 1352 GE (2x)</td>
</tr>
<tr>
<td>Emission standard</td>
<td>Stage 3A</td>
</tr>
<tr>
<td>Max. power kW/HP</td>
<td>726/988</td>
</tr>
<tr>
<td>Max. frequency rpm</td>
<td>1800</td>
</tr>
<tr>
<td>Working pressure bar</td>
<td>350</td>
</tr>
<tr>
<td>Max. oil flow l/min</td>
<td>1000</td>
</tr>
<tr>
<td>Weight kg</td>
<td>13100</td>
</tr>
<tr>
<td>L x W x H mm</td>
<td>5370 x 2480 x 2430</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1400</th>
<th>1600</th>
<th>3200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel engine</td>
<td>Volvo TAD 1353GE (2x)</td>
<td>Volvo TAD 1643 VE (2x)</td>
</tr>
<tr>
<td>Emission standard</td>
<td>Stage -</td>
<td>Stage -</td>
</tr>
<tr>
<td>Max. power kW/HP</td>
<td>898/1222</td>
<td>1130/1536</td>
</tr>
<tr>
<td>Max. frequency rpm</td>
<td>1800</td>
<td>1850</td>
</tr>
<tr>
<td>Working pressure bar</td>
<td>350</td>
<td>350</td>
</tr>
<tr>
<td>Max. oil flow l/min</td>
<td>1400</td>
<td>1600</td>
</tr>
<tr>
<td>Weight kg</td>
<td>13100</td>
<td>13700</td>
</tr>
<tr>
<td>L x W x H mm</td>
<td>5372 x 2480 x 2427</td>
<td>5470 x 2480 x 2520</td>
</tr>
</tbody>
</table>

OUR POWER PACKS DRIVE:

- Winches
- Augers
- Cranes
- Pumps
- SPMT’S
- Vibratory hammers
- Impact hammers
- And much more hydraulic equipment
Dieseko Group BV,
(headquarters)
Lelystraat 49
3364 AH Sliedrecht, the Netherlands
Tel: (+31) 184 410 333
info@diesekogroup.com
www.diesekogroup.com

Woltman Piling & Drilling Rigs
Ambachtsweg 16
3381 LN Giessenburg, the Netherlands
Tel: (+31) 184 652044
info@woltmanrigs.com
www.woltmanrigs.com

PVE Equipment USA Inc.
5011 Vernot Road
Jacksonville, FL 32209, USA
Tel: (+1) 904 765 66 86
info@pveusia.com
www.pveusa.com

Dieseko Polska Spółka z o.o.
Shupa 61
70-784 Szczecin, Poland
Tel: +48 736 241 696
polska@diesekogroup.com
www.diesekogroup.com

Shanghai ICE Construction Equipment Trading Company
No. B8, Building 31, ChuanSha International Industrial Garden,
6999 ChuanSha Road, PuDong District,
201202 Shanghai, P.R. China
Tel: (+86) 21 3468 8990
info@icevibro.com
www.icevibro.com

Dieseko Brasil
Rua Cicero Dias, 42 - CEP 06710-030 - Cotia - SP Brasil
Tel: (+55) 11 996 545 097
info@diesekogroup.com
www.diesekogroup.com

Dieseko Group certified dealer:

Dieseko Pilequip Pty. Ltd.
39 Chapman Road
Vineyard NSW 2765, Australia
Tel: +61 2 9838 3144
info@pilequip.com.au
www.pilequip.com.au

Dieseko Group Polska Spółka z o.o.
Struga 61
70-784 Szczecin, Poland
Tel: +48 736 241 696
polska@diesekogroup.com
www.diesekogroup.com

Shanghai ICE Construction Equipment Trading Company
No. B8, Building 31, ChuanSha International Industrial Garden,
6999 ChuanSha Road, PuDong District,
201202 Shanghai, P.R. China
Tel: (+86) 21 3468 8990
info@icevibro.com
www.icevibro.com

Dieseko Brasil
Rua Cicero Dias, 42 - CEP 06710-030 - Cotia - SP Brasil
Tel: (+55) 11 996 545 097
info@diesekogroup.com
www.diesekogroup.com

Dieseko Group certified dealer: