With over 35 years of experience, MGF is a privately-owned company whose primary focus is the provision of fully engineered excavation support solutions to the civil engineering, construction, rail and utilities sectors. We combine technical expertise and operational performance to ensure the highest levels of customer service. With a focus on developing and promoting industry best practice in excavation safety we aim to assist our customers in creating safe working environments for their employees.

CUSTOMER SERVICE AND SUPPORT
The hire and sale of our products is fully supported by our team of qualified engineers, experienced Technical Sales Representatives, hire desk and operational staff. Our hire centres provide the focal point for service delivery where our hire desk team will be pleased to receive your enquiry.

DELIVERY CAPABILITIES
Our dedicated fleet of vehicles offer a flexible solution to quickly meet our customers delivery needs throughout the UK. We partner with several global shipping companies to ensure we can quickly deliver our products on a global scale.
INTRODUCTION TO EMV PILING HAMMERS

EMVs reduce the cohesion of soils through vibrations which effectively fluidises the soil, making it safer, easier and more efficient to install trench sheets and sheet piles. The weight of the piling hammer and the applied force are enough to drive the trench sheets/sheet piles to the required depth quickly, quietly and efficiently. The same applies when extracting, the required pulling force is minimised due to the reduced friction.

KEY PRODUCT FEATURES & BENEFITS

- Extremely low height of the piling hammer allows driving of long piles
- High push/pull forces increase driving performance
- Fitted with a safety circuit
- All clamps can be rotated 90 degrees to allow face working
- Simple mounting with three hoses
- User friendly design with one-lever operation
- Can be directly attached to the excavator boom or with a quick hitch adapter with 65mm-80mm, 90mm and 100mm pins

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MS-3 HFB</th>
<th>MS-4 HFB</th>
<th>MS-5 HFBV3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Centrifugal Force</td>
<td>max. kN</td>
<td>296</td>
<td>374</td>
</tr>
<tr>
<td>Eccentric Moment</td>
<td>max. kgm</td>
<td>3.0</td>
<td>4.2</td>
</tr>
<tr>
<td>Frequency</td>
<td>max. Hz</td>
<td>50</td>
<td>47.5</td>
</tr>
<tr>
<td>Speed</td>
<td>max. rpm</td>
<td>3000</td>
<td>2850</td>
</tr>
<tr>
<td>Pulling Force</td>
<td>max. kN</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>Push Down</td>
<td>max. kN</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>Max. Power at Vibrator</td>
<td>kW</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>Total Weight (Including clamping device)</td>
<td>kg</td>
<td>830</td>
<td>1230</td>
</tr>
<tr>
<td>Dyn. Weight (Including clamping device)</td>
<td>kg</td>
<td>585</td>
<td>940</td>
</tr>
<tr>
<td>Amplitude</td>
<td>mm</td>
<td>10.3</td>
<td>8.9</td>
</tr>
<tr>
<td>Oil Flow</td>
<td>max. l/min</td>
<td>120</td>
<td>171</td>
</tr>
<tr>
<td>Length</td>
<td>L mm</td>
<td>1153</td>
<td>1216</td>
</tr>
<tr>
<td>Width</td>
<td>B mm</td>
<td>623</td>
<td>725</td>
</tr>
<tr>
<td>Height (Including clamping device)</td>
<td>H mm</td>
<td>1175</td>
<td>1250</td>
</tr>
<tr>
<td>Width at Throat</td>
<td>T mm</td>
<td>260</td>
<td>340</td>
</tr>
<tr>
<td>Standard Clamping Device</td>
<td></td>
<td>MS-U 40</td>
<td>MS-U 60</td>
</tr>
<tr>
<td>Recommended Power Pack</td>
<td></td>
<td>MS-A 110V</td>
<td>MS-A 110V</td>
</tr>
</tbody>
</table>

Note: **DO NOT EXCEED PULL UP/PULL DOWN FORCES IN THE TABLE ABOVE AS THIS WILL DAMAGE THE ELASTOMER RUBBERS/BUFFERS.**
EMV COMPONENT IDENTIFICATION

**MS-3 HFB EMV PILING HAMMER**
Weight - 830kg

**MS-4 HFB EMV PILING HAMMER**
Weight - 1230kg

**MS-5 HFBV3 EMV PILING HAMMER**
Weight - 1580kg

**CARRY FRAME**
Weight - 303kg

**LIFTING CHAIN & CHAIN CLAMP**

**QUICK HITCH HEAD**
65mm - 100mm

<table>
<thead>
<tr>
<th>SIZE</th>
<th>65mm</th>
<th>80mm</th>
<th>90mm</th>
<th>100mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEIGHT</td>
<td>80.5kg</td>
<td>125.5kg</td>
<td>247kg</td>
<td>291kg</td>
</tr>
</tbody>
</table>
RISK ASSESSMENT CHECKLIST

- Consult manufacturers manual before use.
- Ensure a pre-hire checklist has been completed.
- Ensure that a site/task specific Risk Assessment/Method Statement has been prepared prior to use.
- Ensure that lifting operations have been appropriately planned prior to use.
- Ensure that all associated equipment is of sound condition, rated appropriately and is tested in accordance with legislative requirements.

CONSIDER THE FOLLOWING WHEN PREPARING YOUR RAMS

The following list is not exhaustive:
- Have all relevant persons been consulted prior to operations commencing?
- The selection of competent fitters and operatives
- Falling piles
- High pressure fluid injection
- Overturning of plant/equipment
- Proximity of operatives
- Third parties and plant in proximity of operations
- Trapping/impact and other mechanical hazards
- Noise (up to and more than 109dB)
- Heat from EMV when in use and post use
- Proximity of overhead cables and underground services
- Ground conditions
- Environmental Impacts

- Ensure that Temporary Works Coordinators (TWC) and Temporary Works Supervisors (TWS) have been consulted prior to operations commencing.
- If works are permanent, ensure a suitably qualified engineer has been consulted prior to operations commencing.
- Ensure competent operatives are appointed to fit EMVs to excavators prior to operations commencing.
- Ensure competent operatives and supervisors are appointed to operate and assist in the operation of EMVs prior to operations commencing.
- Ensure control measures are in place for the protection of operatives, third parties, plant and structures in the proximity of operations prior to them commencing.
- EMVs should only be operated on firm level ground.
- Ensure any overhead cable hazards and associated risks are identified and controlled.
- Ensure that regular checks are carried out to ensure that hazards are controlled and the equipment is in good working order.
- Ground vibrations may lead to substantial nuisance or hazard to the adjoining areas.
- Improper use of the vibrator can lead to dangerous situations.
ONLY OPERATE THE EMV IF YOU ARE SUITABLY QUALIFIED AND COMPETENT TO DO SO

COMPLETE ALL THE REQUIRED WEEKLY, DAILY AND PRE-USE CHECKS – REPORT ANY DEFECTS

ENSURE THERE IS VISUAL CONTACT BETWEEN THE OPERATOR AND THE SLINGER/SIGNALLER (OR BANKSMAN) AT ALL TIMES

MONITOR THE PILING OPERATION CONSTANTLY – INTERRUPT THE PROCESS IMMEDIATELY IF THERE ARE OPERATIONAL ISSUES OR ANY DANGER OCCURS

FOLLOW THE AGREED (AND BRIEFED) SAFE SYSTEM OF WORK/RAMS

DO NOT OPERATE THE EMV IF ANYONE IS IN THE EXCLUSION ZONE

DO NOT ENTER THE EXCLUSION ZONE IF THE EMV IS BEING OPERATED

DO NOT USE THE EMV IF IT IS FAULTY IN ANY WAY

DO NOT TOUCH THE EMV DURING THE OPERATING PROCESS (EVEN WHEN THE EXCAVATOR IS SWITCHED OFF) AS IT CAN BECOME VERY HOT

USER GUIDE SECTION 3

PILING HAMMERS (EMV)
EMV OPERATION

4.1 EMV CARRY FRAME

- The EMV will be delivered to site in a carry frame. Ensure that this is stood on flat level ground.
- Ensure that the EMV is placed in the carry frame and all restraining chains/straps are in place when not in fitted to an excavator/in use.

LIFTING EMV IN AND OUT OF THE CARRY FRAME

This will normally be on the pecker circuit control, usually a pedal or a joystick button, this should be clearly marked once established to open the jaw. Then open the clamp jaw fully and lift out of the frame.

When replacing the EMV into the frame, make sure the jaw clamp is fully open. Locate the jaw clamp, grip on the carry frame grip plate and the 4 corners of the vibrator are in the white plastic landing pads, carefully close the jaw clamp just long enough to close the jaw but not vibrate.

STORING AT THE END OF PILING OPERATIONS

The EMV should be returned to the carry frame and the jaw clamp closed. The safety restraining chains should be attached before lifting the EMV and frame.
4.2 ATTACHING THE EMV QUICK HITCH TO EXCAVATOR QH

IT IS ADVISED THAT THE EMV SHOULD BE FITTED BY AN MGF SERVICE ENGINEER MAKING THE NECESSARY HOSE CONNECTIONS AND CHECKING FOR FULL FUNCTIONALITY. THE EMV SHOULD ONLY BE OPERATED BY SUITABLY TRAINED PERSONNEL.

1. Position excavator quick hitch over EMV
2. Open QH lock fully, this will activate an audible alarm, engage QH on EMV

3. When located, crowd QH to engage the 2nd QH pin
4.2 ATTACHING THE EMV QUICK HITCH TO EXCAVATOR QH - CONTINUED

3

- Close QH lock, observe the locking
- Mechanism is fully home and the audible alarm has deactivated

4

- Typical QH lock safety switch used in conjunction with bucket crowd circuit
- Alarm has deactivated
### 4.3 PITCHING AND DRIVING

1. Remove the EMV from the stand by releasing the clamp. Ensure that the restraining chains are removed.
2. Position the EMV over the end of the pile and attach the lifting chain through the lower lifting hole, securing with the chain clamp.
3. Lift and place the pile. Attach the EMV clamp to the top of the pile ensuring the lifting chain has sufficient length and is not snagged.
4. With the dipper arm in a vertical position (or as close to) start the vibration and drive the pile into the ground making sure the EMV is level and is directly on top of the pile. Check for correct alignment.
5. Turn the vibration off once the pile has reached the desired depth. Release the clamp and lifting chain.

**INCORRECT**

EMV should be kept vertical at all times.

**CORRECT**

When operating the EMV during piling operations the driver MUST ensure that the dipper arm is adjusted constantly to avoid mechanical lock-out between the quick hitch and swivel bracket.

*Note: Ensure all personnel are out of the working area when driving the sheet piles.*
4.3 PITCHING AND DRIVING - CONTINUED

Note: When removing sheet piles, it is recommended to start the pull with the dipper arm in a horizontal (or close to) orientation.

Operating in the planes shown will result excessive forces in the connections and could lead to damage/failure and possible injury.

The Quick Hitch should operate between the horizontal and vertical planes shown. This is to be maintained at all times by the excavator driver through constant control of the dipper arm and bucket controls.

12
5.1 DAILY CHECKS

DAILY CHECKS TO BE CARRIED OUT BY COMPETENT OPERATIVES, CONTACT MGF FOR SUPPORT OR ADVICE, IF UNSURE: ASK!

- Oil level should be checked in carry frame and on level ground.
- Check condition of hydraulic hoses for damage and leaks.
- Grease suspension head swivel and jaw clamp daily.
- Check safety chains are connected before lifting carry frame.
- Check condition of toggle chain and shackle.
- Check condition of chain clamp and it is clean and lubricated.
- Keep quick release couplings clean.
- Check condition of fixed and moving jaw grip.
- Check split pins are fitted correctly and nut and bolts adequately tightened.
- Check elastomer rubbers and buffers for damage.
- Check quick hitch is correctly fitted and locked in to the attachment.
- Ensure that checks are carried out on the quick hitch/suspension head for damage and cracks in welds.
TROUBLE SHOOTING

6.1 REFUSAL
If the EMV/sheet pile is making little progress (less than 250mm in 5 mins) operations MUST be suspended continuing is liable to cause damage/failure.

6.2 REBOUND
Rebound occurs when the sheet pile hits an obstruction or hard layer in the ground which cannot be penetrated during piling operations, energy is then transferred back through the sheet pile into the hammer, quick hitch and suspension head, operations MUST be suspended if rebound occurs as this will result in damage/failure.

6.3 TEMPERATURE
The temperature of the bearing caps MUST NOT exceed 90°C if there are signs of steam/smoke rising from the EMV operations MUST be suspended as continuing is liable to cause damage/failure.

6.4 PRESSURE IN EMV CIRCUIT WHEN DISCONNECTING / CONNECTING HOSES
A build-up of pressure from the hydraulic system in the excavator hoses can make it difficult to reattach the hoses to the EMV once removed.
To avoid this, before disconnecting the quick release couplings/hoses turn the excavator engine off then switch ignition on, activate the dead man lever, press the pedal slowly forward then backwards several times, this will de pressurise the circuit making it easy to connect the hoses to the EMV.

6.5 REFERENCES
• Shoring Technology Interest Group (SITG) – Safety in Shoring
• CPA Shoring Technical Information Note - TIN 208 - Safe Use of Excavator Mounted Vibrators
• Müller vibrator operating manuals
MGF PROVIDE A SUPPORT SERVICE FOR THE FITTING AND USE OF EMVS

PLEASE CONTACT US FOR DETAILS
T: 0808 256 9364
E: piling@mgf.ltd.uk