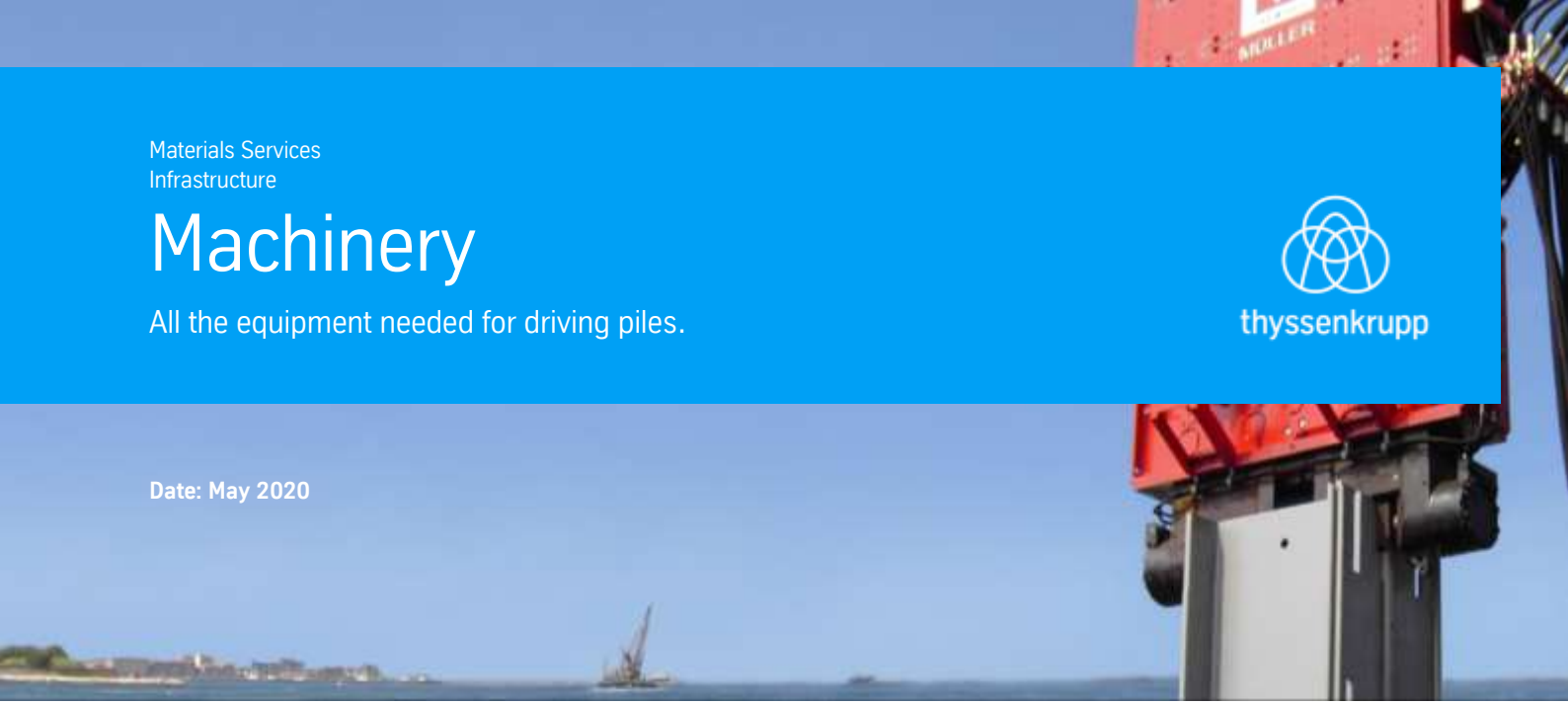


Materials Services
Infrastructure

# Machinery

All the equipment needed for driving piles.

thyssenkrupp

Date: May 2020

**Optimal machinery and equipment are the key to cost-effective work in marine and foundation engineering projects.**

We supply our customers with all of the machinery and equipment they need to drive steel sheet piling, tubular piles, beams, and other piling sections in the course of easy to complex pile driving jobs. We also provide a convincing technical concept and ensure that the project is executed cost-effectively.

There is a wide range of technologies available for installing piles: driving and extracting, pressing, hammering or drilling. Depending on the on-site requirements, we offer our customers a broad spectrum of suitable machinery, with a range of variants and performance variables, turning as well to our own products such as müller driving and extracting equipment and our drill drives.

# Contents

## Technical handbook

## Parameters

Choosing the right machine is crucial for the economic and technical success of vibratory driving. In order to find the most suitable equipment, we offer our customers individual support that takes into account all relevant factors, i.e., the site conditions plus the geological and engineering requirements.

## Equipment selection

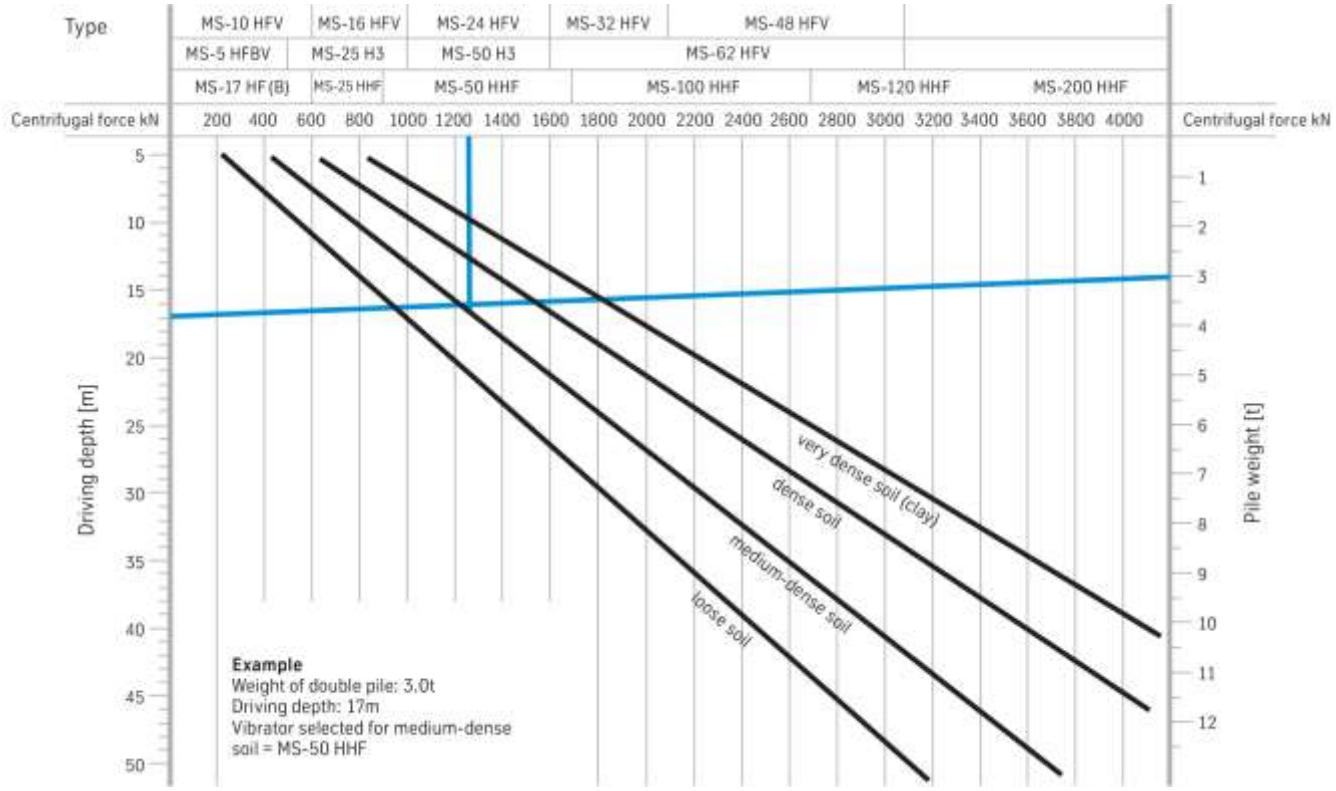
The chart below helps users to select the right vibrator or determine the centrifugal force required depending on soil conditions, pile weight, and driving depth.

The use of additional equipment, e.g., water-jetting or predrilling units, can help to achieve much better driving performance with the same size of unit or centrifugal force of the vibrator.

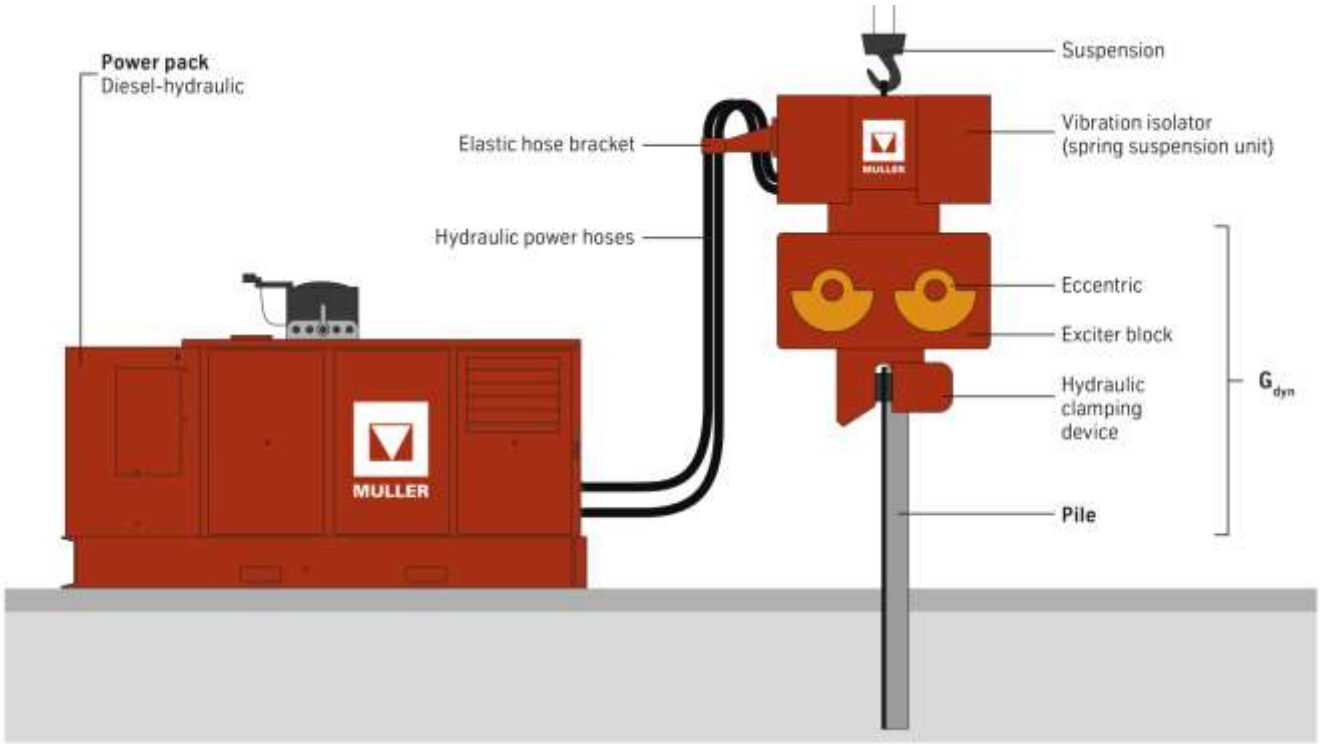
The power pack must be powerful enough to generate the moment needed to maintain the centrifugal force of the vibrator, even in difficult ground. The drive output should be 2.5–3.5 HP per 1 US ton of centrifugal force.

Our advisers use numerical simulation software for selecting equipment to suit the soil parameters and pile section data exactly

### Equipment selection chart



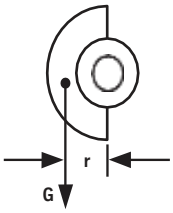
# Operating principle of müller vibrators (typical design)




## Key vibration technology data

**Eccentric moment M [kgm]**

$M = G \cdot r$




The eccentric moment is the measure of unbalance. As a determining factor for amplitude it is a key parameter for driving operations.

**Speed (frequency) n [rpm]**

The speed dictates the vibration frequency of the system. The vibrations are transferred via the pile to the surrounding soil, significantly reducing the surface friction between pile and soil. High frequencies counter the unwanted spread of vibrations in the soil.

**Centrifugal force F [N]**

$F = M \cdot \omega^2$

$F = M \cdot \left(\pi \cdot \frac{n}{30}\right)^2$

The centrifugal force must be high enough to overcome surface friction between pile and soil. Centrifugal force plays a major part in reducing surface friction and provides impact force to overcome tip resistance.

**Total amplitude S [m]**

$$S = 2s = \frac{2 \cdot M_{stat}}{G_{dyn}} \frac{[kgm]}{[kg]}$$

Together with centrifugal force, amplitude is a measure of driving performance. A large 'stroke' and high 'impact force' ensure good driving progress. When driving and extracting in cohesive soils, the elastic connection between pile and soil can only be broken, if the amplitude is high enough.

**Acceleration a [m/s²]**

$a = s \cdot \omega^2$ with $\omega = \pi \cdot \frac{n}{30}$

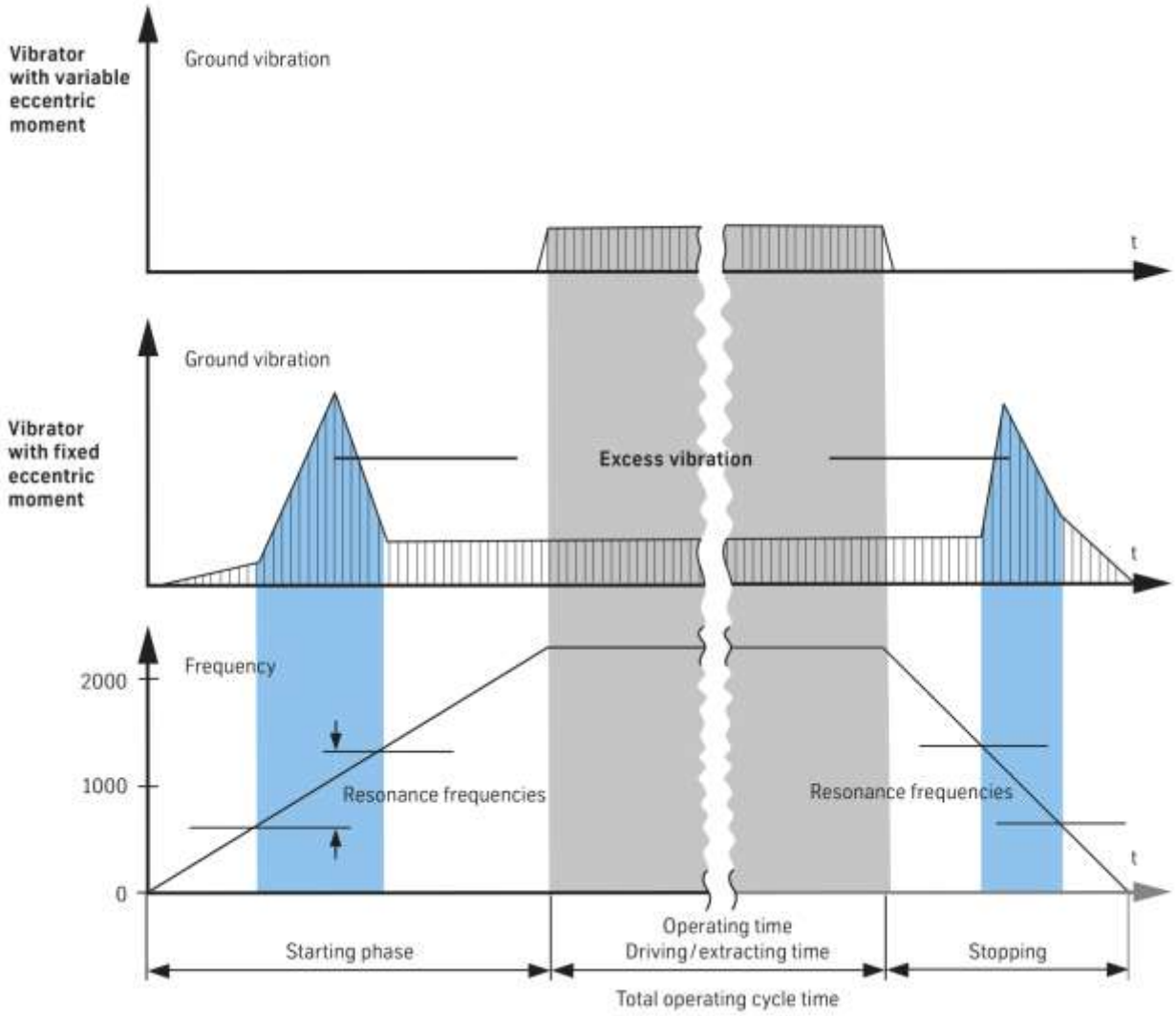
Transmission of the pile acceleration to the surrounding soil causes the displacement of the grain structure and reduces grain friction and soil resistance. Acceleration is expressed as the ratio of acceleration of the vibrator to gravity:

$\eta = \frac{a}{g}$ This ratio corresponds to : $\eta = \frac{F \cdot 10^{-1}}{G_{dyn}}$

The value can lie between 10 and 30.

# müller vibrators H, HHF or HFV series

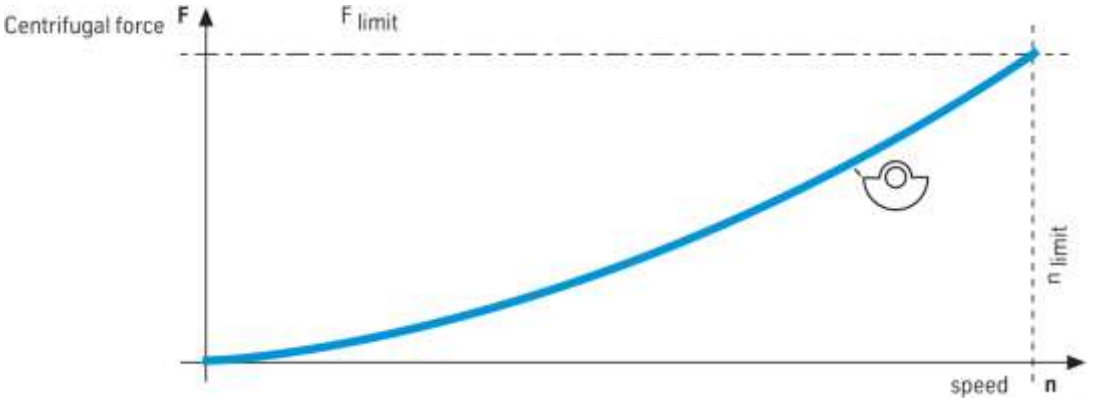
## Principle of resonance-free starting and stopping



# müller vibrators H series

| Technical Data | | | | | | |
|---|---|---|---|---|---|---|
| Type | | | MS-25 H3 | MS-35 H3 | MS-50 H3 | MS-65 H3 |
| Centrifugal force | F (max.) | kN | 774 | 834 | 1430 | 1670 |
| Eccentric moment | M stat | kgm | 25 | 32.5 | 50 | 65 |
| Speed | n (max.) | $min^{-1}$ | 1,680 | 1,530 | 1,615 | 1,530 |
| Frequency | f (max.) | Hz | 28.0 | 25.5 | 26.9 | 25.5 |
| Pulling force | F pull (max.) | kN | 400 | 400 | 500 | 500 |
| Weight (dynamic) | without clamping device | kg | 2,550 | 2,660 | 3,820 | 4,200 |
| Weight (total) | without clamping device | kg | 3,600 | 3,600 | 8,050 | 8,200 |
| Amplitude | without clamping device/pile | mm | 19.6 | 24.4 | 26.2 | 31.0 |
| Displacement | Q motor (max.) | l/min | 425 | 463 / 386 | 719 | 680 / 773 |
| Pressure | p (max.) | bar | 350 | 350 | 350 | 350 |
| Power consumption | P (max.) | kW | 248 | 270 / 228 | 419 | 397 / 450 |
| Dimensions | Length L | mm | 2,250 | 2,250 | 2,800 | 2,800 |
| | Width B | mm | 777 | 865 | 722 | 737 |
| | Height H | mm | 1,745 | 1,760 | 2,140 | 2,105 |
| | Throat T | mm | 402 | 402 | 402 | 402 |
| Recommended power pack | Type | MS-A | 260 / 290 | 290 / 260 | 420 | 420/515/570 |
| Single clamping device | Type | MS-U | 80 / 100 | 80 / 100 | 180 | 200 |
| | alternative Type | MS-U | 150 | 150 | – | 250 |
| Double clamping device | Type | MS-U | 2 x 54 | 2 x 54 | 2 x 80 / 100 | 2 x 80 / 100 |
| | alternative Type | MS-U | 2 x 90 | 2 x 90 | 2 x 90 | – |

## Fixed eccentric moment

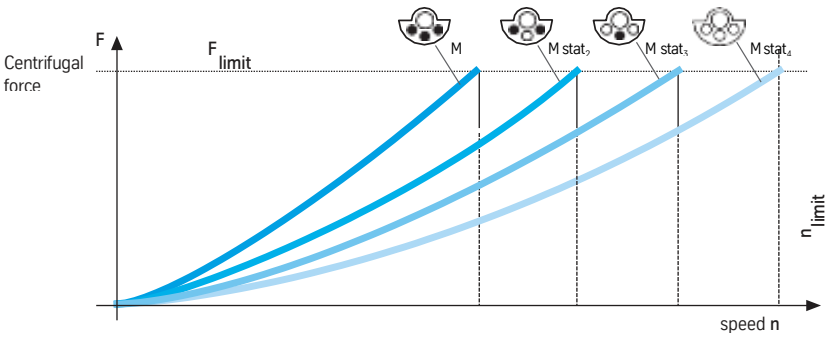


# müller vibrators HHF series

| Technical Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Type | | | MS-25 HHF | MS-50 HHF | MS-100 HHF | MS-120 HHF | MS-200 HHF | MS-240 HHF |
| Centrifugal force | F (max.) | kN | 750 | 1,500 | 2,500 | 3,003 | 4,000 | 5,160 |
| Eccentric moment | M stat (max.) | kgm | 25 | 50 | 100 | 116 | 190 | 240 |
| Steps *(see illustration)* | | kgm | 12 / 15 / 20 / 25 | 24 / 30 / 40 / 50 | 48 / 60 / 80 / 100 | 80 / 94 / 110 / 116 | (98) / 110 / 150 / 190 | 151 / 193 / 218 / 240 |
| Speed steps | n (max.) | $min^{-1}$ | 2,280 / 2,113 / 1,830 / 1,637 | 2,362 / 2,113 / 1,830 / 1,637 | 2,160 / 1,920 / 1,670 / 1,500 | 1,850 / 1,700 / 1,570 / 1,536 | (1,800) / 1,800 / 1,560 / 1,371 | 1,770 / 1,560 / 1,470 / 1,400 |
| Frequency steps | f (max.) | Hz | 38 / 35.2 / 30.5 / 27.3 | 39.3 / 35.2 / 30.5 / 27.3 | 36 / 32 / 27.8 / 25 | 30.9 / 28.3 / 26.2 / 25.6 | (30) / 30 / 26 / 22.9 | 29.5 / 26 / 24.5 / 23.4 |
| Pulling force | F pull (max.) | kN | 280 | 500 | 600 | 1,200 | 1,200 | 1,200 |
| Weight dynamic | without clamping device | kg | 2,900 | 4,500 | 7,700 | 8,900 | 11,750 | 12,010 |
| Weight total | without clamping device | kg | 3,700 | 6,100 | 10,900 | 15,500 | 18,500 | 19,000 |
| Amplitude | without clamping device / pile | mm | 8.3 / 10.3 / 13.8 / 17.2 | 10.7 / 13.3 / 17.8 / 22.2 | 12.5 / 15.6 / 20.8 / 26.0 | 18.0 / 21.1 / 24.7 / 26.1 | 16.7 / 18.7 / 25.5 / 32.4 | 25.1 / 32.1 / 36.3 / 40.0 |
| Displacement | Q motor (max.) | l/min | 298 / 470 | 610 / 964 | 1,045 / 1,286 | 989 / 1,150 / 1,534 | 1,435 / 1680 | 1,770 |
| Pressure | p (max.) | bar | 350 | 350 | 350 | 350 | 350 | 350 |
| Power consumption | P (max.) | kW | 174 / 274 | 356 / 562 | 610 / 750 | 577 / 671 / 895 | 837 / 980 | 1,032 |
| Dimensions | Length L | mm | 1,800 | 2,260 | 2,410 | 2,300 | 2,300 | 2,300 |
| | Width B | mm | 813 | 888 | 846 | 1,200 | 1,430 | 1,510 |
| | Height H | mm | 1,885 | 2,465 | 3,235 | 4,215 | 4,170 | 4,190 |
| | Throat T | mm | 360 | 350 | 500 | 832 | 832 | 832 |
| Power pack | Type | MS-A | 260 / 290 | 420 / 570* | 700 / 840* | 840 / 1,050/ 1,150 | 840 / 1,050/ 1,150* | 1,050 / 1,150* |
| Single clamping device | Type | MS-U | 90 | 180 | 360 | 360 | – | – |
| | alternative | MS-U | 80 / 100 A | 200 | – | – | – | – |
| Double/quadruple clamping device | Type | MS-U | 2 x 54 | 2 x 80 / 100 G | 2 x 150 | 2 x 180 G | 2 x 250 G | 4 x 180 G |
| | alternative | MS-U | – | – | 2 x 180 G | – | 4 x 150 G | – |
| | alternative | MS-U | – | – | 2 x 180 G | – | – | – |

* Combination for increased performance

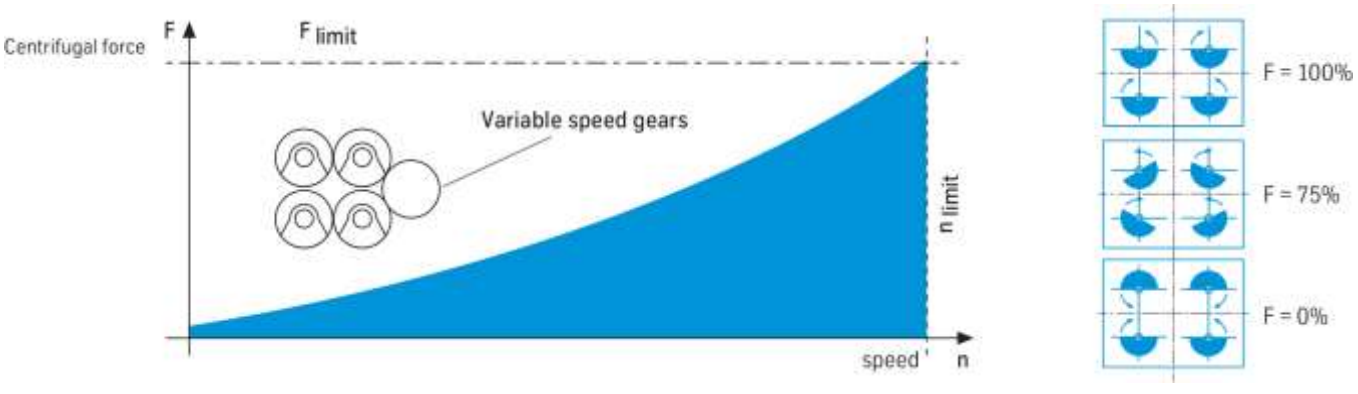
## Stepwise variable moment



## müller vibrators HFV series

| Technical Data | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | | | MS-10 HFV | MS-12 HFV | MS-16 HFV | MS-20 HFV | MS-24 HFV | MS-28 HFV | MS-32 HFV | MS-40 HFV | MS-48 HFV | MS-62 HFV |
| Centrifugal force | F (max.) | kN | 610 | 739 | 986 | 1,230 | 1,480 | 1,473 | 1,980 | 2,006 | 2,960 | 2,998 |
| Eccentric moment | M stat (variable) | kgm | 0–10 | 0–12,3 | 0–16 | 0–19.5 | 0–24 | 0–28 | 0–32 | 0–39.2 | 0–48 | 0–62 |
| Speed | n (max.) | min-1 | 2,358 | 2.340 | 2,370 | 2,400 | 2,350 | 2,190 | 2,375 | 2,160 | 2,350 | 2,100 |
| Frequency | f (max.) | Hz | 39.3 | 39,0 | 39.5 | 40.0 | 39.2 | 36.5 | 39.6 | 36.0 | 39.0 | 35.0 |
| Pulling force | F pull (max.) | kN | 180 | 210 | 300 | 300 | 400 | 500 | 600 | 600 | 600 | 800 |
| Weight (dynamic) | without clamping device | kg | 1,700 | 1.750 | 2,565 | 2,530 | 2,900 | 3,120 | 4,850 | 5,050 | 6,520 | 6,805 |
| Weight (total) | without clamping device | kg | 2,300 | 2.350 | 3,530 | 3,600 | 5,005 | 5,320 | 7,250 | 7,610 | 9,700 | 11,165 |
| Amplitude | without clamping device/pile | mm | 11.8 | 14,1 | 12.5 | 15.4 | 16.5 | 18.0 | 13.2 | 15.5 | 14.7 | 18.2 |
| Power consumption | P (max.) | kW | 147 / 203 | 229 | 297 / 408 | 413 | 404 / 551 | 428 / 514 | 570 / 685 | 630/756 | 682 / 823 | 980 / 735 |
| Displacement | Q motor (max.) | l/min | 253 / 348 | 393 | 508 / 699 | 708 | 693 / 945 | 734 / 880 | 1,045 / 1,175 | 1,080 / 1,296 | 1,170 / 1,410 | 1,680 / 1,260 |
| Pressure | p (max.) | bar | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 | 350 |
| Dimensions | Length L | mm | 1,635 | 1.635 | 2,080 | 2,080 | 1,920 | 1,920 | 2,371 | 2,657 | 2,371 | 2,371 |
| | Width B | mm | 732 | 732 | 782 | 782 | 893 | 893 | 800 | 826 | 1,123 | 1,180 |
| | Height H | mm | 1,530 | 1.530 | 2,060 | 2,060 | 2,240 | 2,240 | 2,455 | 2,460 | 2,525 | 2,525 |
| | Throat T | mm | 330 | 330 | 350 | 350 | 451 | 451 | 345 | 437 | 860 | 860 |
| Recommended power pack | Type | MS-A | 190 / 260 | 290 | 260 / 290 | 420 | 420 / 515 | 420 / 515 | 570 / 700 | 700 / 840 | 700 / 840 | 1,150 / 1,050 |
| | Type | MS-A | 290 | | 420 | | 570 | 570 | | | | |
| Single clamping device | Type | MS-U | 72 | 80 / 100 | 150 A | 150 A | 180 A | 180 A | 250 A | 250 A | 360 A | 360 A |
| Double clamping device | Type | MS-U | 2 x 54 | 2 x 54 | 2 x 90 | 2 x 90 | 2 x 90 | 2 x 90 | 2 x 150 G | 2 x 150 G | 2 x 180 G | 2 x 180 G |

## Variable eccentric moment

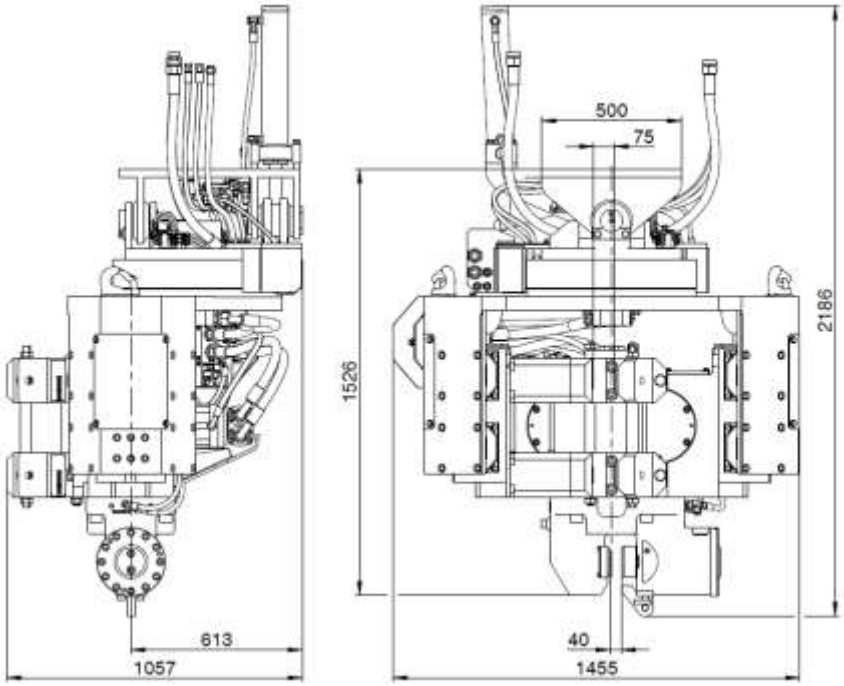


# müller excavator-mounted vibrator side gripper HFB SG series

## Technical Data

| Type | | | MS-4 HFB SG | MS-6 HFB SG | MS-7 HFB SG |
|---|---|---|---|---|---|
| Centrifugal force | F (max.) | kN | 374 | 464 | 500 |
| Eccentric moment | M stat (max.) | kgm | 4.2 | 6.6 | 7.0 |
| Frequency | f (max.) | Hz | 47.5 | 42.5 | 42.5 |
| Speed | n (max.) | min-1 | 2,850 | 2,550 | 2,550 |
| Pulling force | F Zug (max.) | kN | 120 | 120 | 120 |
| Pressure force | F Pressure (max.) | kN | 120 | 120 | 120 |
| Weight (dynamic) | including lower clamping device | kg | 1,235 | 1,245 | 1,245 |
| Weight (total) | including lower clamping device | kg | 2,110 | 2,120 | 2,120 |
| Amplitude | including lower clamping device | mm | 6.7 | 10.5 | 11.3 |
| Power consumption | P (max.) | kW | 100 | 119 | 119 |
| Displacement | Q motor (max.) | l/min | 171 | 204 | 204 |
| Dimensions | Length L | mm | 1,455 | 1,455 | 1,455 |
| | Width B | mm | 1,057 | 1,057 | 1,057 |
| | Height H (including lower clamping device) | mm | 1,526 | 1,526 | 1,526 |
| Standard clamping device | | MS-U | 60 | 72 | 72 |
| Special clamping device | | MS-U | 60 K | 72 K | 72 K |
| | | MS-U | 80 / 100 A | 80 / 100 A | 80 / 100 A |

The maximum operating pressure for all excavator-mounted vibrators is 350 bar.

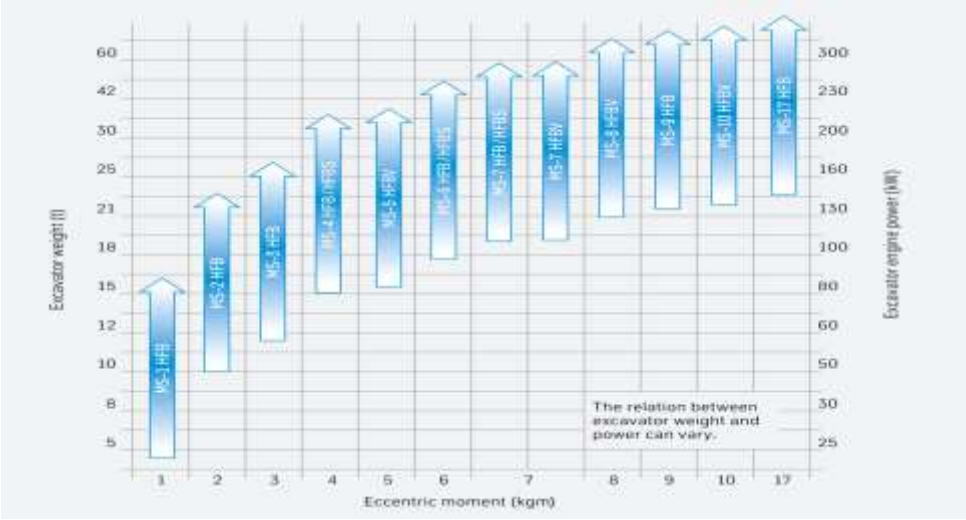


# müller excavator-mounted vibrators
# MS-HFB series / MS-HFBS series with fixed eccentric moment

| Technical Data | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type | | | MS-1 HFB | MS-2 HFB | MS-3 HFB | MS-4 HFB | MS-6 HFB | MS-7 HFB | MS-9 HFB | MS-17HFB | MS-4 HFBS | MS-6 HFBS | MS-7 HFBS |
| Centrifugal force | F (max.) | kN | 90 | 245 | 296 | 374 | 464 | 604 | 606 | 604 | 378 | 464 | 604 |
| Eccentric moment | M stat (max.) | kgm | 0.7 | 2.2 | 3.0 | 4.2 | 6.5 | 7.0 | 8.5 | 17.0 | 4.2 | 6.5 | 7.0 |
| Frequency | f (max.) | Hz | 56.0 | 53.1 | 50.0 | 47.5 | 42.5 | 46.7 | 42.5 | 30.0 | 47.5 | 42.5 | 46.7 |
| Speed | n (max.) | $min^{-1}$ | 3,360 | 3,185 | 3,000 | 2,850 | 2,550 | 2,800 | 2,550 | 1,800 | 2,850 | 2,550 | 2,800 |
| Pulling force | F pull (max.) | kN | 34 | 60 | 60 | 120 | 120 | 150 | 150 | 140 | 120 | 120 | 150 |
| Pressure force | F Pressure (max.) | kN | 34 | 40 | 40 | 80 | 80 | 80 | 80 | 170 | 80 | 80 | 80 |
| Power consumption | P (max.) | kW | 60 | 61 | 70 | 100 | 119 | 130 | 133 | 158 | 100 | 119 | 130 |
| Weight, dynamic (incl. standard clamping device) | | kg | 230 | 570 | 585 | 940 | 950 | 950 | 990 | 1,453 | 1,110 | 1,120 | 1,130 |
| Weight, total (incl. standard clamping device) | | kg | 350 | 815 | 830 | 1,230 | 1,240 | 1,300 | 1,380 | 2,208 | 1,360 | 1,370 | 1,380 |
| Amplitude (incl. standard clamping device) | | mm | 6.1 | 7.7 | 10.3 | 8.9 | 13.7 | 14.7 | 17.2 | 23.4 | 7.7 | 11.6 | 12.4 |
| Displacement | Q motor (max.) | l/min | 102 | 105 | 120 | 171 | 204 | 224 | 228 | 270 | 171 | 204 | 224 |
| Length | L | mm | 722 | 1,153 | 1,153 | 1,239 | 1,239 | 1,239 | 1,239 | 1,714 | 1,410 | 1,410 | 1,410 |
| Width | B | mm | 472 | 623 | 623 | 742 | 742 | 742 | 762 | 917 | 697 | 697 | 697 |
| Height (incl. standard clamping device) | H | mm | 761 | 1,024 | 1,024 | 1,249 | 1,249 | 1,249 | 1,249 | 1,461 | 1,250 | 1,250 | 1,250 |
| Throat | T | mm | 230 | 260 | 260 | 340 | 340 | 340 | 340 | 340 | – | – | – |
| Standard clamping device | Type | MS-U | 12 | 40 | 40 | 60 | 60 | 72 | 72 | 72 | 60 | 60 | 60 |
| Recommended power pack | Type | MS-A | – | – | | 190 | 190 | 190 | 190 | 190 | 190 | 190 | 190 |

The maximum operating pressure for all excavator-mounted vibrators is 350 bar.

## Equipment selection chart



# müller excavator-mounted vibrators
# MS-HFBV series with variable eccentric moment

| Technical Data | | | | | | |
|---|---|---|---|---|---|---|
| Type | | | MS-5 HFBV* | MS-7 HFBV* | MS-8 HFBV | MS-10 HFBV |
| Centrifugal force | F (max.) | kN | 400 | 478 | 585 | 588 |
| Eccentric moment | M stat (max.) | kgm | 0–5 | 0–6.7 | 0–8 | 0–9.8 |
| Frequency | f (max.) | Hz | 45.0 | 42.5 | 43.0 | 39.0 |
| Speed | n (max.) | $min^{-1}$ | 2,700 | 2,550 | 2,580 | 2,340 |
| Pulling force | F pull (max.) | kN | 120 | 120 | 150 | 150 |
| Pressure force | F Pressure (max.) | kN | 80 | 80 | 150 | 150 |
| Power consumption | P (max.) | kW | 95/126 | 112/126 | 165/120 | 167/148 |
| Weight, dynamic (incl. standard clamping device) | | kg | 1,130 | 1,150 | 1,035 | 1,340 |
| Weight, total (incl. standard clamping device) | | kg | 1,580 | 1,600 | 1,815 | 1,865 |
| Amplitude (incl. standard clamping device) | | mm | 8.8 | 11.3 | 12.4 | 14.6 |
| Displacement 5-hose connection | Q motor (max.) | l/min | 162/216 | 204/230 | 283/206 | 293/257 |
| Displacement 3-hose connection | Q motor (max.) | l/min | 180/240 | 220/250 | – | – |
| Length | L | mm | 1,350 | 1,350 | 1,554 | 1,554 |
| Width | B | mm | 707 | 707 | 761 | 761 |
| Height (incl. standard clamping device) | H | mm | 1,423 | 1,419 | 1,457 | 1,457 |
| Throat | T | mm | 390 | 390 | 415 | 415 |
| Recommended power pack | Type | MS-A | 190 | 190 | 190 | 190 |
| Standard clamping device | Type | MS-U | 60 | 60 | 72 | 72 |

The maximum operating pressure for all excavator-mounted vibrators is 350 bar.
*Option: with three or five connecting hoses

# müller power packs

| Technical Data | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | MS-A 190-0 (V)* | MS-A 260 (V)* | MS-A 340 (V)* | MS-A 420 (V)* | MS-A 420 (V)* | MS-A 570 (V)* | MS-A 700 (V)* | MS-A 700 (V)* | MS-A 840 (V)* | MS-A 840 (V)* | MS-A 1150 (V)* |
| **Diesel motor** | | | CAT | CAT | CAT | CAT | CAT | Volvo-Penta | CAT | CAT | CAT | CAT | Volvo-Penta |
| Type | | ATAAC | C 7.1 | C 9 | C 9.3B | C 15 | C 13B | TAD 1643 | 2 x C 13 | 2 x C 9.3B | 2x C 15 | 2x C 13B | 2x TAD 1643 VE |
| Exhaust certification | | EU/ EPA | V/Tier 4f | IIIA /Tier 3 | V/Tier 4f | IIIA /Tier 3 | V/Tier 4f | II/Tier 2 | IIIA /Tier 3 | V/Tier 4f | IIIA / Tier 3 | V / Tier 4f | II / Tier 2 |
| Power | P (max.) | kW | 186 | 261 | 340 | 433 | 430 | 565 | 708 | 680 | 866 | 860 | 1,130 |
| Speed | n (max.) | $min^{-1}$ | 2,100 | 2,100 | 2,100 | 2,000 | 2,000 | 1,850 | 2,100 | 2,100 | 2,100 | 2,100 | 1,850 |
| **Hydraulics** | | | | | | | | | | | | | |
| Feed rate | Q (max.) | l/min | 310 | 525 | 525 | 740 | 740 | 1,050 | 1,180 | 1,080 | 1,480 | 1,480 | 2,100 |
| Operating pressure | p (max.) | bar | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 | 380 |
| Fuel tank capacity | | l | 400 | 550 | 550 | 900 | 900 | 1,050 | 1,400 | 1,400 | 2,200 | 2,200 | 2,200 |
| Hydraulic tank capacity | | l | 500 | 250 | 250 | 280 | 280 | 440 | 500 | 500 | 600 | 600 | 600 |
| Weight without fuel | | kg | 4,400 | 5,000 | 5,600 | 6,200 | 6,800 | 8,500 | 10,300 | 10,600 | 12,500 | 13,600 | 13,800 |
| Dimensions | Length L | mm | 3,200 | 3,700 | 3,950 | 4,250 | 4,250 | 4,750 | 4,800 | 4,800 | 5,300 | 5,300 | 5,300 |
| | Width B | mm | 1,400 | 1,490 | 1,480 | 1,700 | 1,700 | 2,000 | 2,200 | 2,200 | 2,400 | 2,400 | 2,400 |
| | Height H | mm | 2,100 | 2,340 | 2,350 | 2,450 | 2,450 | 2,510 | 2,450 | 2,530 | 2,570 | 2,600 | 2,595 |

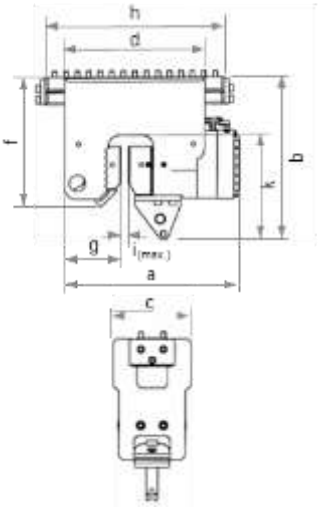
*optionally with variable amplitude

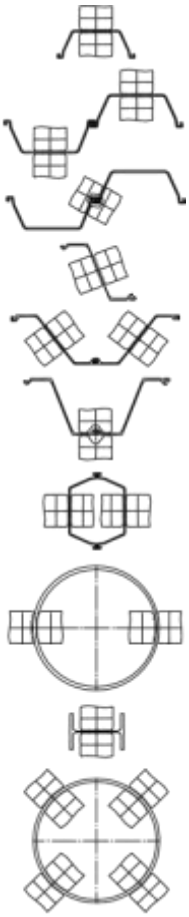
# müller leader-mounted drill drives

| Technical Data | | | | | | |
|---|---|---|---|---|---|---|
| Type | | | MS-RHA 12 3* | MS-RHA 16 3* | MS-RHA 24 3* | MS-RHA 34 3* | MS-RHA 46 3* |
| Torque | M (max.) da | Nm | 1,200 | 1,600 | 2,400 | 3,400 | 4,600 |
| Speed | n (max.) | $min^{-1}$ | 125 | 115 | 110 | 100 | 70 |
| Oil pressure | p (max.) | bar | 350 | 350 | 350 | 350 | 350 |
| Feed rate | Q motor (max.) | l/min | 260 | 350 | 460 | 600 | 600 |
| Diameter | Smallest drilling diameter | mm | 200 | 200 | 400 | 400 | 400 |
| Diameter | Largest drilling diameter | mm | 700 | 900 | 1,200 | 1,400 | 1,600 |
| Weight | without auger/without stand | kg | 300 | 360 | 440 | 600 | 760 |
| Drill depth | With smallest drilling diameter (max.) | m | 20 | 25 | 14 | 16 | 20 |
| Drill depth | With largest drilling diameter (max.) | m | 4 | 4 | 2 | 2 | 2 |
| Hexagon connection | | mm | 70 / 70 | 70 / 80 | 80 / 80 | 100 / 100 | 120 / 120 |

*Connection to excavator stick
Options available on request: mounted on leader, fitted in vibrator clamp
Clamping in a vibrator

# müller clamping devices.



Arrangement of clamps

Technical Data

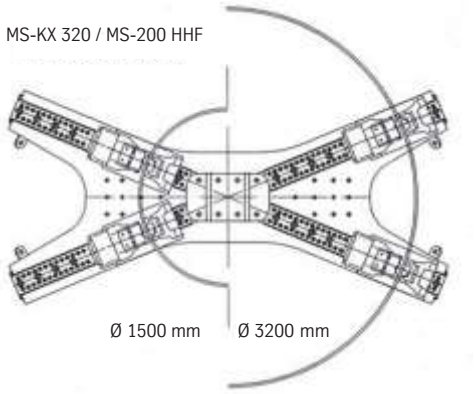
| Type | Clamping force kN | Clamping pressure bar | Dimensions in mm a | c | d | f | g | h | i. max. | IPB min | Weight kg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MS-U 12* | 122 | 260 | 229 | 195 | 195 | 223 | 95 | – | 15 | 120 | 50 |
| MS-U 40* | 370 | 300 | 548 | 260 | 400 | 285 | 175 | – | 40 | 120 | 145 |
| MS-U 54** | 540 | 350 | 648 | 270 | 515 | 694 | 190 | 730 | 22 | 180 | 440 |
| MS-U 60* | 600 | 300 | 640 | 320 | 480 | 350 | 220 | – | 40 | 140 | 260 |
| MS-U 72* | 720 | 358 | 640 | 320 | 480 | 350 | 220 | – | 40 | 140 | 260 |
| MS-U 80/100 A* | 800 / 1,000 | 280 / 350 | 798.5 | 330 | 519 | 410 | 216.5 | – | 48 | 280 | 400 |
| MS-U 80/100 G** | 800 / 1,000 | 280 / 350 | 760 | 340 | 580 | 509 | 206.5 | – | 48 | – | 670 |
| MS-U 90** | 900 | 350 | 770 | 340 | 580 | 529 | 290 | 820 | 28 | 180 | 515 |
| MS-U 150 GP** | 1,500 | 350 | 892 | 340 | 640 | 554 | 309 | 780 | 45 | 320*** | 920 |
| MS-U 150 AP* | 1,500 | 350 | 902 | 360 | 660 | 580 | 319 | – | 40 | 320*** | 940 |
| MS-U 180 GP** | 1,800 | 350 | 903 | 390 | 745 | 645 | 325 | 880 | 80 | 320*** | 1,250 |
| MS-U 180 AP* | 1,800 | 350 | 893 | 390 | 740 | 645 | 314 | – | 80 | 320*** | 1,130 |
| MS-U 250 G** | 2,500 | 350 | 1,173 | 398 | 860 | 840 | 364 | 1,150 | 63 | 450 | 2,450 |
| MS-U 250 A* | 2,500 | 350 | 1,173 | 395 | 860 | 840 | 380 | – | 63 | 450 | 1,950 |
| MS-U 360 A* | 3,600 | 350 | 1,255 | 460 | 1180 | 950 | 520 | – | 80 | 400 | 3,130 |

* for direct bolting ** shiftable on clamping bar *** IPB 300 possible with special equipment

# müller accessories

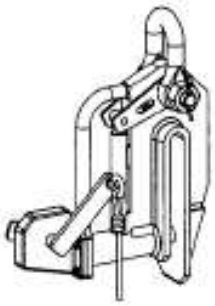
## Bracket

So-called X-brackets are available in various sizes for driving large-diameter, heavy, tubular piles.

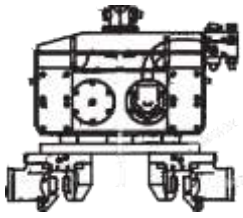



## müller ground release shackle

| Technical Data | | |
|---|---|---|
| Type | Pulling force kN | Weight kg |
| MS-SSZ-3 B | 30 | 15 |
| MS-SSZ-4 B | 40 | 24 |
| MS-SSZ-5 B | 50 | 26 |



# Additional accessories for excavator-mounted units



## Adapter plate /double clamping devices driving pipe piles

## müller universal connecting fork for excavator-mounted units

This accessory enables MÜLLER excavator-mounted vibrators and drilling units to be attached to the majority of excavators. It is fitted with three different connecting pins. The benefits are the fast change over from drilling unit to vibrator and the stable construction. Other connecting forks are available on request.

# GIKEN Silent Piler

| Type | | |
|---|---|---|
| **SILENT PILER F301** | | |
| **Standard mode** | | |
| Max. pressing force / max. extracting force | kN | 1,100 / 1,200 |
| Stroke | mm | 850 |
| Pressing rate /extracting rate | m/min | 2.0-43.5 / 1.5-32.3 |
| Control system | | Remote control |
| Movement | | Self-moving |
| Weight | kg | 12,000 |
| Start frame weight | kg | 3,000 |
| **Water-Jetting mode** | | |
| Piler jet reel | | JR28 |
| Pile length | m | 17 (max. 27) |
| Water jet volume | max. l/min | 600 |
| Water jet pressure | max. MPa | 10.0 |
| Weight incl. jet reel | kg | 12,820 |
| **Super-Crush mode** | | |
| Max. pressing force | kN | 800 |
| Max. extracting force | kN | 900 |
| Stroke | mm | 850 |
| Pile length | m | 24 (max. 30) |
| Total weight (main body and hose reel) | kg | 15,780 |
| **SILENT PILER F401** | | |
| **Standard mode** | | |
| Max. pressing force / max. extracting force | kN | 1,500 / 1,600 |
| Stroke | mm | 1,000 |
| Pressing rate /extracting rate | m/min | 1.3-27.0 / 1.0-20.2 |
| Control system | | Remote control |
| Movement | | Self-moving |
| Weight | kg | 25,600 |
| Start frame weight | kg | 3,950 |
| **Water Jetting mode** | | |
| Jet hose | | JR29 |
| Pile length | m | 16 |
| Water jet volume | max. l/min | 600 |
| Water jet pressure | max. MPa | 10.0 |
| Weight incl. hose | kg | 26,850 |
| **Super-Crush mode** | | |
| Max. pressing force | kN | 1,200 |
| Max. extracting force | kN | 1,600 |
| Stroke | mm | 1,000 |
| Pile length | m | 24 (max. 30) |
| Total pile auger weight (for 24m pile) | kg | 20,800 |
| **Power pack for SILENT PILER** | | **EU300K4** |
| Output in power mode | kW /min$^{-1}$ | 265 / 1,800 |
| Output in eco mode | kW /min$^{-1}$ | 236 / 1,600 |
| Output in super eco mode | kW /min$^{-1}$ | 206 / 1,400 |
| Fuel tank | l | 600 |
| AdBlue Fuel tank | l | 38 |
| Speed | km/h | 1.4 |
| Weight | kg | 7,250 |

**Nozzle layout**

Single Z-pile section

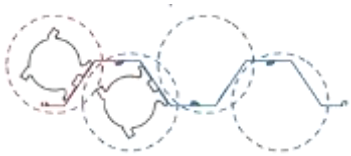
Single U-pile section

Double Z-pile section

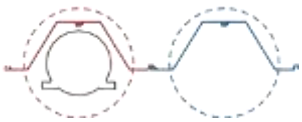
Double U-pile section

**Auger drilling dimensions**

Single Z-pile section



Double Z-pile section



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