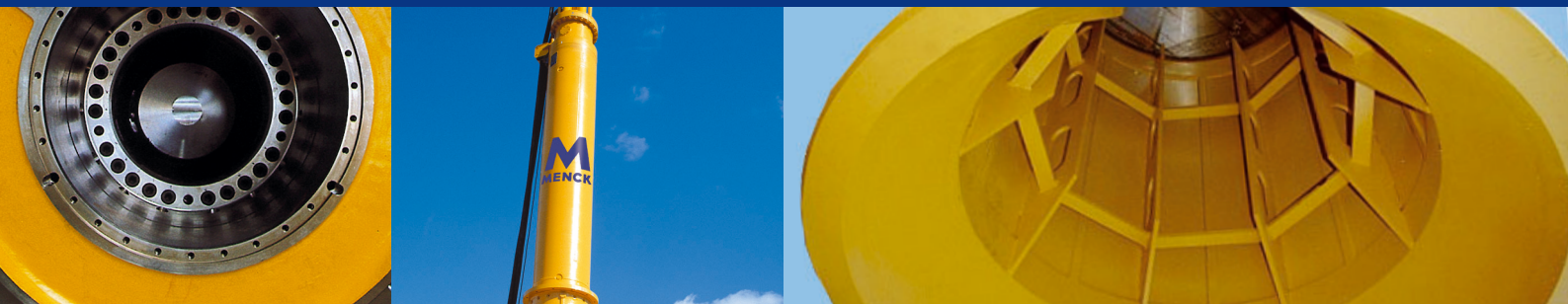




MENCK's MHU hammer design is based on 130 years of experience in manufacturing piling hammers. Originally designed for deepwater services, the MHU design became the industry standard for the full range of applications. In combination with MENCK's surface power packs (MHP) or MENCK's unique patented submersible electric-hydraulic power packs (MUP) a wide range of MHU hammers offer specialised solutions for deepwater anchoring, shallow water jackets, windmills, bridges and port construction.

MHU



Designed to perform

MENCK's MHU hammer design features operational safety, economical efficiency and versatility in combination with smart technical solutions for high reliability and low operating and maintenance cost.

Operational safety

Safe operation is very important. The MHU hammer series is equipped with two safety shut-off devices: one monitors the position of the shackle to avoid transfer of driving loads to the crane; the other monitors the correct position of the anvil on the pile and prevents driving if the two are not aligned.

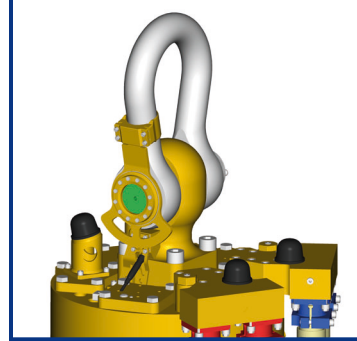
Economic efficiency and versatility

Hammer weight: MHU hammers are double acting; the hydraulic drive unit lifting the ram provides additional hydraulic acceleration during the downward stroke for increased efficiency and weight reduction. MHU hammers, made up with anvil and pile sleeve, are lighter and shorter than other hammers allowing smaller cranes and higher pile stick-up especially on inclined piles.

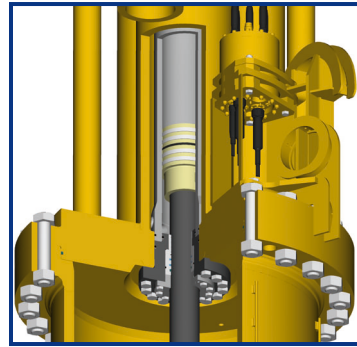
Oil flow requirements: Due to its high efficiency, the MHU hammer design needs less oil flow (gallons/litres per minute) to operate. Consequently, the requirements on hoses and power packs are reduced leading to significant cost reductions.

Driving efficiency: The special dome shaped anvil transfers most of the energy from the ram directly to the pile. However, some energy is accumulated and released to the pile over time. This behaviour reduces peak loads in the pile and generates a longer force transition period leading to more penetration per blow, less driving time and consequently higher productivity combined with a longer fatigue life expectancy of the pile.

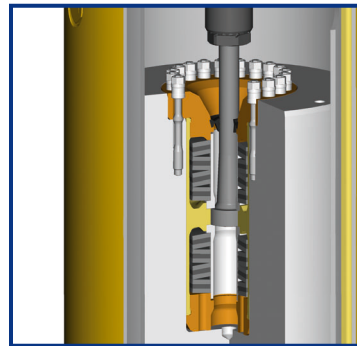
Energy control: MHU hammers are equipped with a closed-loop "delivered energy" control system that compensates internal losses and provides the operator with the highest possible control over the energy transferred to the pile. It provides for a very smooth and constant operation of the hammer.



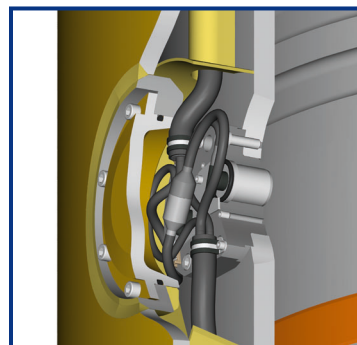
1 Shackle safety shut-off device



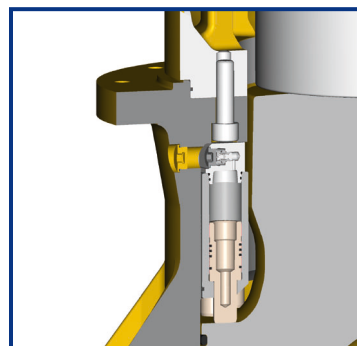
2 Double acting hydraulic drive unit



3 Connection piston rod to ram via spring suspension unit



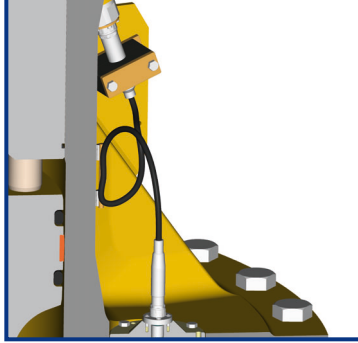
4 Ram position control-stroke height and energy - via proximity switches



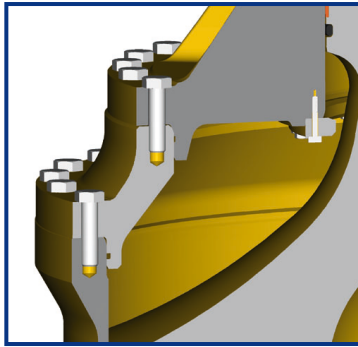
5 Hammer housing shock isolation - nitrogen shock absorber ring



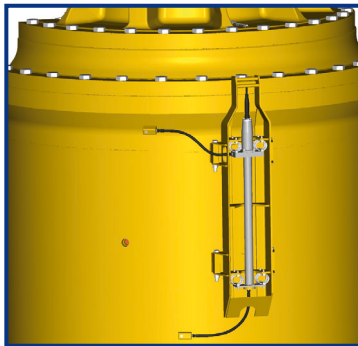
Hydraulic hoses and umbilical (air hose optional for underwater use)



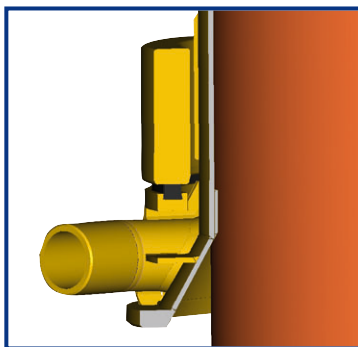
6 Anvil-on-pile safety shut-off device



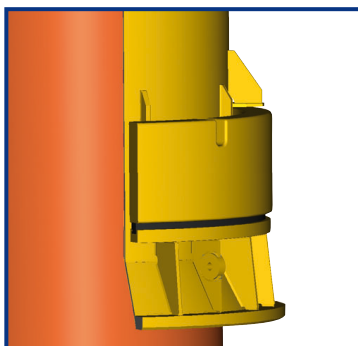
7 Flexible pile sleeve connection with pile sleeve adapter flange



8 Water level monitoring with water-level-pile-sleeve sensor



9 Eccentric trunnions for very compact upending frame design



10 Optional ballast weight for underwater use

Commissioning: MHU hammers do not require an extensive set of special tools or any expert knowledge. That makes commissioning easy even in remote locations.

Maintenance: The modular design of MENCK's MHU hammer series allows simple and fast maintenance without the need of extensive disassembling. MENCK provides complete modules as spare parts in new and – as part of the parts replacement programme – in used but fully remanufactured condition. Lubrication service to the hammer was reduced to a minimum with the introduction of the built-in grease system. Air travelling through the annulus of the double-walled hammer housing collects grease and distributes it through the entire hammer housing.

Smart technical solutions

Piston to ram connection: The flexible piston connection in conjunction with large diameter ram bearings reduces friction making the MENCK MHU hammer the optimal solution for inclined piles at any angle. The spring-loaded suspension system isolates the hydraulic drive unit from shockwaves travelling through the ram during pile driving and avoids extensive wear of the hydraulic components.

Shock absorber: The unique heavy duty hydro-pneumatic shock absorber ring mounted inside the lower end of the hammer housing protects the hammer and auxiliary components from rebound forces and other shock loads.

Underwater driving: MENCK MHU hammers are the perfect piling tool for underwater work at any water depth. The automatic pressure compensation system maintains the pressure inside the hammer slightly higher than the outside water pressure. Compressed air fills the dome shaped anvil through specially designed ventilation holes preventing water blows with associated energy losses. During the upward stroke of the ram, excess water inside the pile flows out through the vent holes. Not having to cut vent holes in piles for water release improves the fatigue life of the piles. MHU hammers can operate in 10,000 ft of water and even deeper.

6

8

10

The flexibility of the MHU design allows several configurations. All configurations share common basic design features described in this folder but vary in their depth rating. The "S" hammer series (S designates Standard) is built for shallow water applications up to 400 m (1,300 ft) of water. The "T" hammer series (T meaning Deep) is equipped for 2,000 m (6,500 ft) water

depth. The "U" hammer series (U is for Ultra-deep) is outfitted for 3,000 m (10,000 ft) and beyond.

MENCK's unique patented submersible electric-hydraulic power pack (MUP) is available for all MHU-T and MHU-U hammers up to 1,000 kJ (MHU 900T and MHU 810U) of energy.

MHU hammer

S hammer	150S	220S	300S	440S	550S	660S	800S	1000S	1200S	1500S	1700S	1900S	2100S	2400S	2700S	3000S
T hammer	135T	200T	270T	400T	500T	600T	720T	900T								
U hammer			240U	360U	450U	540U	650U	810U								

Operational data

Minimum energy kJ	15	20	30	40	50	60	80	100	110	150	170	190	210	240	270	300
Maximum energy kJ	150	230	305	440	550	660	800	1000	1200	1530	1730	1930	2140	2430	2750	3050
Recom. oil flow l/min	380	550	700	1000	1150	1250	1600	2000	2400	3000	3200	3200	3600	4200	4500	5100
Blow rate bl/min	38	38	40	38	38	32	38	38	38	38	35	32	32	32	32	32
Hammer weight t	21.1	25.4	30.8	44.2	54.2	67	79.6	104.6	119.2	134	145	157.6	215	240	255	280
Hammer length m	7.5	8.5	9.6	10.7	11.8	11.2	12.5	13.2	14.3	15.5	16.4	17.4	15.4	16.5	17.2	18.1

Standard configuration

Pile sleeve	48"	1.6 m	1.6 m	60"	72"	72"	84"	96"	96"	102"	102"	102"	108"	108"	108"	108"
Total weight above water t	32.7	44.8	52.3	74	87.3	107	139.2	175	203.3	195	214	231.1	330	380	400	450
Total weight submerged t	24.5	35.3	41.5	59.5	70.5	86.1	112	140	163.4	155	172	187.7	270	300	330	365

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