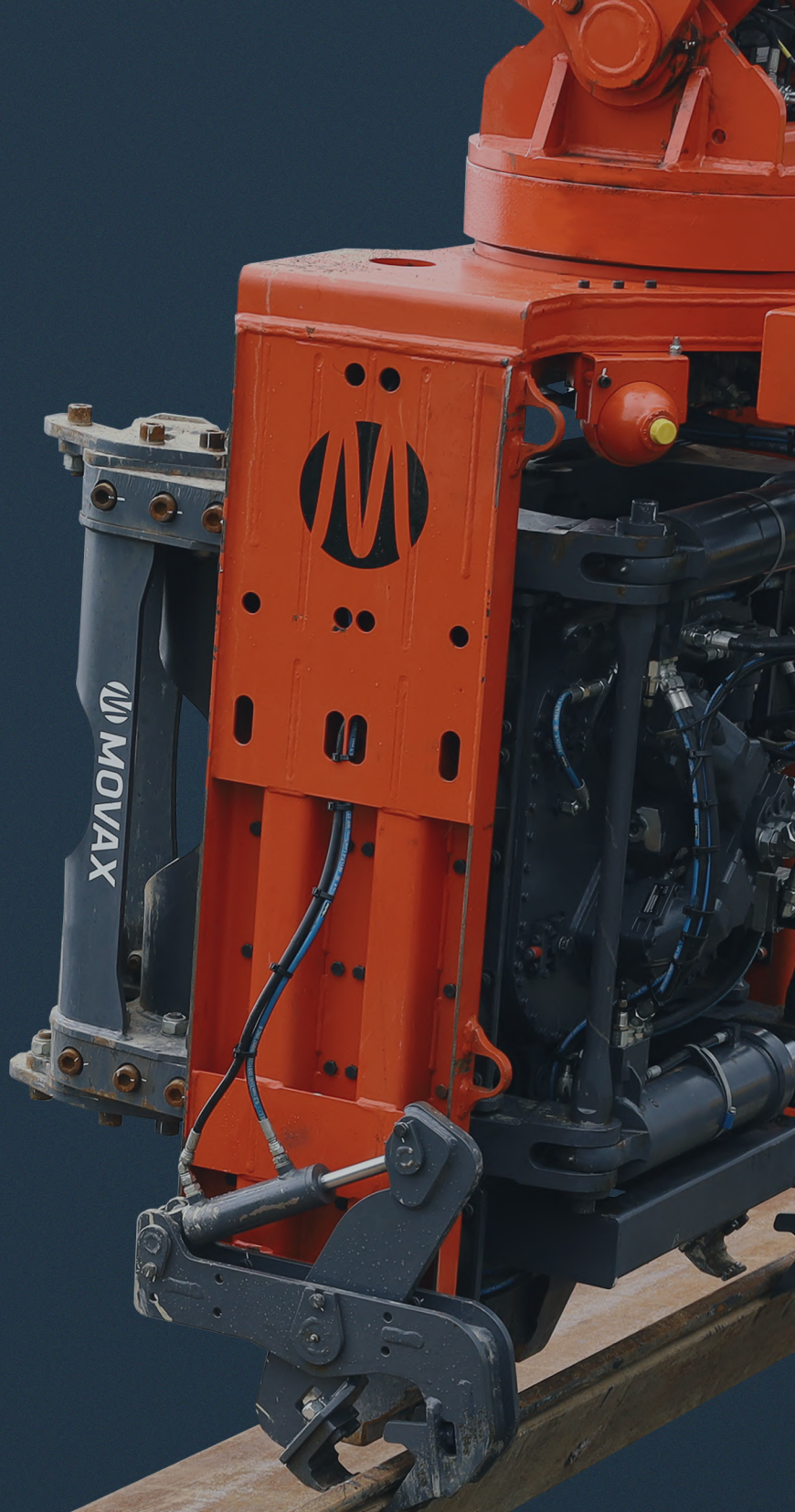




SG-VA Variable Active

TECHNICAL
SPECIFICATION



VALID
FROM
MAR25

INTRODUCTION

SIDE GRIP TECHNOLOGY

MOVAX Side grip pile drivers are excavator-mounted, high-frequency, vibratory-type pile drivers providing the optimum solution for a wide range of piling requirements – especially when a high degree of precision is required; and for piling in sensitive environments and when limited space, head room or access is available.



HANDLING

HIGHER PRODUCTIVITY – SIGNIFICANT SAVINGS

Efficient. Fast. Versatile. Accurate. Safe. Reliable.

The same unit can handle, pitch and drive – and extract – different type of piles and is capable of accomplishing the entire piling process without the need of manual handling or assisting machinery. Furthermore there is no need for additional work, material and tools.



MOVAX mControl+ control system ensures a fast, efficient, accurate and safe pile driving process leading to higher productivity and quality.



PITCHING



DRIVING/EXTRACTING

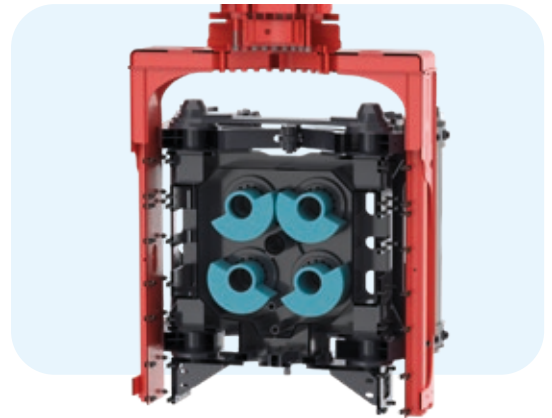


INTRODUCTION

VIBRATORY PILE DRIVER TECHNOLOGY

Vibratory pile drivers work by reducing the resistance and formation of the ground by the means of vibration. Vertical vibrations are transferred from the vibratory pile driver to the pile via a hydraulic arm or clamp (gripping the pile).

The vibration then travels from the pile to the soil, thus reducing the friction between the pile and the ground allowing the pile to be driven or extracted with less force. The pile is driven to the ground by a combination of the vibrator's weight, centrifugal force it produces and the downward force put out by the excavator.



The nature of vibration is to move through matter - everything has its natural resonance, i.e. the frequency in which they have a tendency to vibrate and oscillate. In order to avoid oscillation and thus disturbances to the surroundings, including the ground itself, buildings and structures, it is recommendable to avoid vibrating at natural frequencies.

Vibratory pile drivers are designed for operation at either a high frequency (HF) typically above 33 Hz/2300 rpm or at a low frequency (LF) typically below 24 Hz/1700 rpm.

MOVAX side grip vibratory pile drivers

MOVAX invented the side grip technology in 1993. Since the first fixed eccentric model designed primarily to handle and drive sheet piles the MOVAX side grip pile driver have over the years developed to a versatile modular design side grip pile driver capable of handling a wide range of different types of piles from sheet piles and H-beams to tubular steel piles, trench sheets and timber piles. The resonance-free technology was introduced to allow operation in sensitive conditions.

The nextGeneration, variable active, side grip pile driver introduced in 2023 takes the technology yet again to the next level in efficiency and performance.

1993

Established in
Hämeenlinna, Finland



1995-2000

SP-40, SP-50:
B, C and D-models



2006-2012

SP-50, SP-60:
F-models



1994

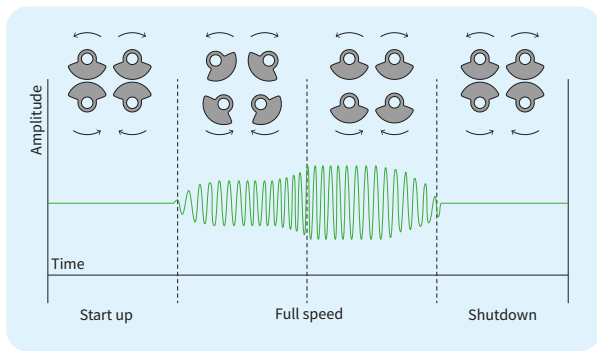
1st side grip pile driver,
UV-50/UV-75



2000-2007

SP-40, SP-50, SP-60:
E-models





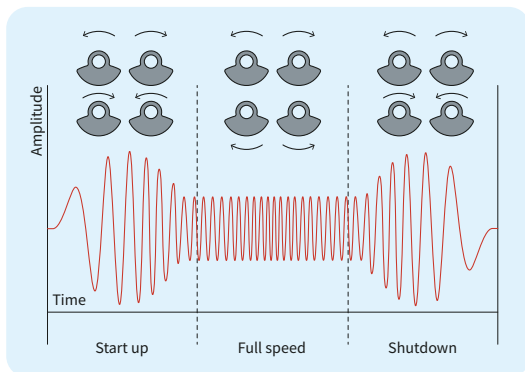
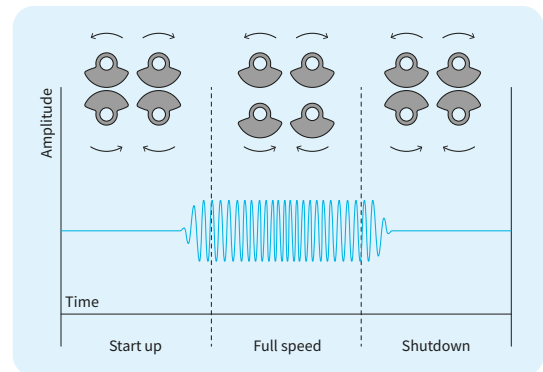
Variable active eccentric moment

The variable active technology allow the adjustment of the eccentric moment - and thus the amplitude - during pile driving or extraction. The variable active moment optimizes the use of the excavators hydraulic power by maintaining the highest possible force in challenging soil conditions and preventing the formation of resonance frequencies throughout the piling process.

The start-up and shutdown of **variable active type** vibratory pile drivers are resonance free, thus minimizing any disturbances to the surrounding soil or structures.

Resonance-free

The resonance-free technology allows for starting up and shutting down the side grip pile driver without vibration. This is achieved for instance by shifting the upper row eccentrics in respect to the lower row eccentrics. The total eccentric moment of resonance free type vibratory pile drivers can be switched from 0% during start-up to 100% during operation and back to 0% during shut down thus minimizing any disturbances to the surrounding soil or structures.



Fixed eccentric moment

Fixed eccentric vibratory pile drivers are either high frequency (2300-3000 rpm/38- 50 Hz) or low frequency (24 Hz/1700 rpm) vibratory pile drivers. The fixed eccentric moment pile drivers are suitable for a wide range of piling works in different site and soil conditions when there is no need to minimize disturbances to the surroundings.

2011-2013

new Generation modular side grip (SG) pile driver

2023

next Generation Variable active (SG-VA) side grip pile driver: models SG-80VA

2012-2015

Resonance-free modular (SG-V) side grip pile driver

2016-2017

SG facelift

2018-2020

SG-LITE series

MOVAX
Total Piling Solutions

2024

Variable active side grip pile drivers SG-45VA, SG-50VA & SG-65VA



SIDE GRIP VIBRATORY PILE DRIVERS

FEATURES

EXCAVATOR-MOUNTED

- Suitable for 7-50 ton excavators.
- Utilizing the hydraulic power and lifting capacity of the excavator or rail loader (carrier).
- Designed to work on any and all wheeled and crawler-type excavators and rail loaders by utilising and commanding the standard auxiliary hydraulics and/or by connecting to the electronic control of the excavator.

COMPREHENSIVE MODEL & SIZE RANGE

- Available in different models, sizes and configurations for different piling requirements and different type of piles ranging sheet piles, trench sheets and, H-beams to tubular steel piles and timber piles
- Available for excavators ranging from 7 to 50 ton – thus always ensuring the optimum size and correct combination of vibratory pile driver and excavator.

HIGH FREQUENCY

- High frequency HF (2300-3000 rpm / 38-50 Hz) vibratory pile driver
- Specifically designed to be used with an excavator or rail loader as carrier.

STATE-OF-THE ART VIBRATION TECHNOLOGY

- Variable eccentric moment (VA-models) for optimum performance under all site and soil conditions. VA-models are also resonance-free under all operating conditions.
- Available also with fixed eccentric moment (STD/LITE).

MOVAX MODULAR SYSTEM

- Versatility based on the MOVAX Modular System™ which enables the use of the same unit for a wide range of different piling requirements, piling work and type of piles.
- Optional handling clamps available for U- & Z-piles.

MOVAX CONTROL SYSTEM

- MOVAX Control System, mControl+
 - mControl+ LITE
 - mControl+ PRO with automatic tip-control for maximised productivity and quality.
- Advanced, real-time monitoring of
 - Clamping pressure (*electronically monitored, actual pressure of all individual cylinders*)
 - Gear oil pressure
 - Gear oil temperature

MOVAX INFORMATION MANAGEMENT SYSTEM

- mFleetManagement for monitoring MOVAX piling equipment operation, performance and condition.
- mLogbook for monitoring and reporting the piling works.



HANDLING, PITCHING, DRIVING AND EXTRACTING PILES



SIDE GRIP VIBRATORY PILE DRIVERS

SELECTION

The optimal MOVAX side grip pile driver for a specific piling & foundation application is selected based on the following:

- technology (variable active, resonance-free, fixed eccentric)
- excavator brand and model
- soil & site conditions
- pile dimensions (weight & length/diameter)



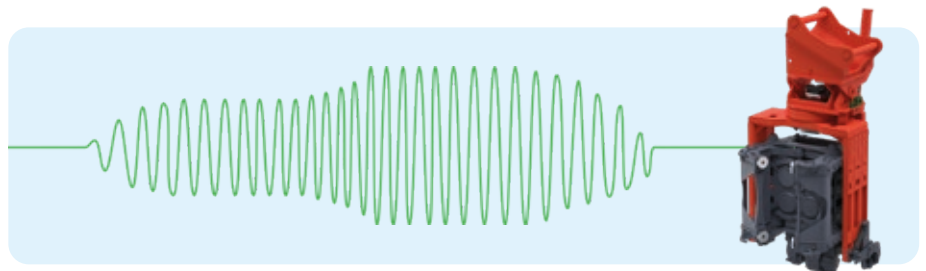
The configuration ie. the arms, clamps and/or pads of the MOVAX side grip pile driver are then selected based on the type of piles to be driven.



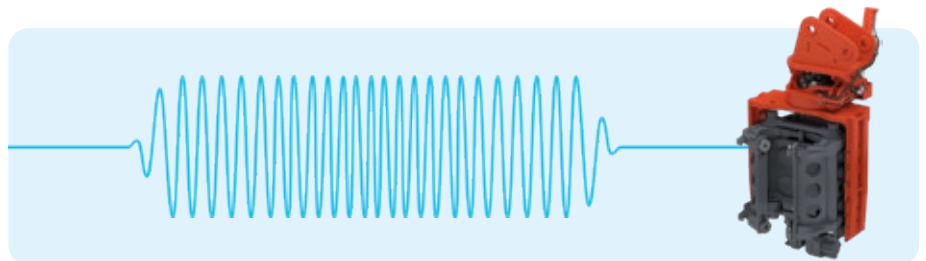
Model (technology)

MOVAX side grip vibratory pile driver-models are available based on three different (vibro)technologies: variable eccentric moment (VA), resonance-free (V) and with fixed eccentric moment (STD/LITE). MOVAX side grip vibratory pile drivers are available with variable active moment, resonance-free start/stop (V) and with fixed eccentric moment.

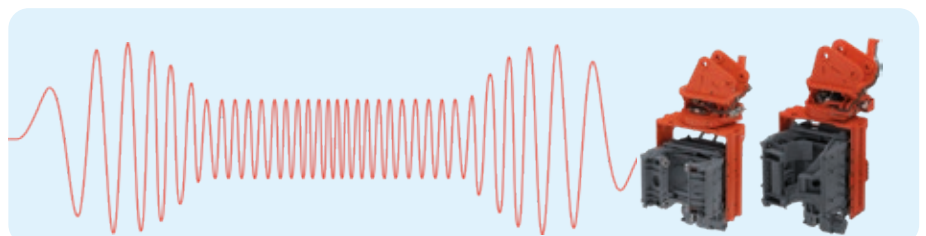
Variable Active (VA) models are selected for the most demanding applications and for sensitive areas where disturbances to the surroundings are to be minimized.



Resonance-free (V) models are selected for sensitive areas where disturbances to the surroundings are to be minimized.



Fixed eccentric (LITE & STD) models are selected for a wide range of piling jobs.



Excavator (brand & model)

The excavator must be suitable – and match – the specific vibratory pile driver in question in regards to hydraulic power (oil flow @ pressure). Thus the excavator brand & model is needed for the correct selection of model.

Type & dimension of piles

In order to select the correct MOVAX model, the type of piles (sheet pile, H-beam, tubular steel pile and/or timber pile) and their dimensions (length, width/depth, OD) are needed.

The arms, clamps and pads are selected based on the piles to be driven. Due to the modular design (*MOVAX Modular System*) the same MOVAX side grip pile driver can be used to drive different type of piles.

Soil conditions

Vibratory pile drivers are suitable for a wide range of soil conditions & N-values (SPT). In order to make a detailed analysis of the suitability of a MOVAX model for a specific project a soil report is needed.

Site conditions

MOVAX side grip pile drivers are the optimum solution for sites with limited access, space or headroom. Standard (STD) and Lite models are selected for a wide range of piling jobs. Variable active (VA) and Resonance-free (V) models are selected for sensitive areas where disturbances to the surroundings are to be minimized.

SELECTION CHART

EXCAVATOR CLASS/	33-50 t	28-32 t	23-28 t	20-24 t	17-21 t	13-16 t	7-11 t
PILE SIZE (length/weight)							
6 m x 2800 kg 12 m x 1900 kg 16 m x 1300 kg	SG-80VA SG-75V SG-75						
8 m x 2300 kg 12 m x 1800 kg 16 m x 1200 kg		SG-65VA SG-60V SG-60	SG-50VA SG-50V SG-50	SG-45VA SG-45V SG-45			
6 m x 1200 kg 12 m x 1000 kg 16 m x 900 kg					SG-40N SGL-15	SG-30N SGL-15	
4 m x 400 kg 6 m x 200 kg							SG-15N SGL-15
SUITABLE PILES							
Sheet piles / trench sheets	width 400-1200 mm				width 400-1200 mm		width 400-600 mm
H-beams	H100-H500				H100-H400		H100-H140
Timber piles	Ø160–600 mm				Ø120–325 mm		Ø100–200 mm
Tube piles	Ø88.9–1220 mm				Ø88.9–508 mm		Ø88.9– 323.9 mm

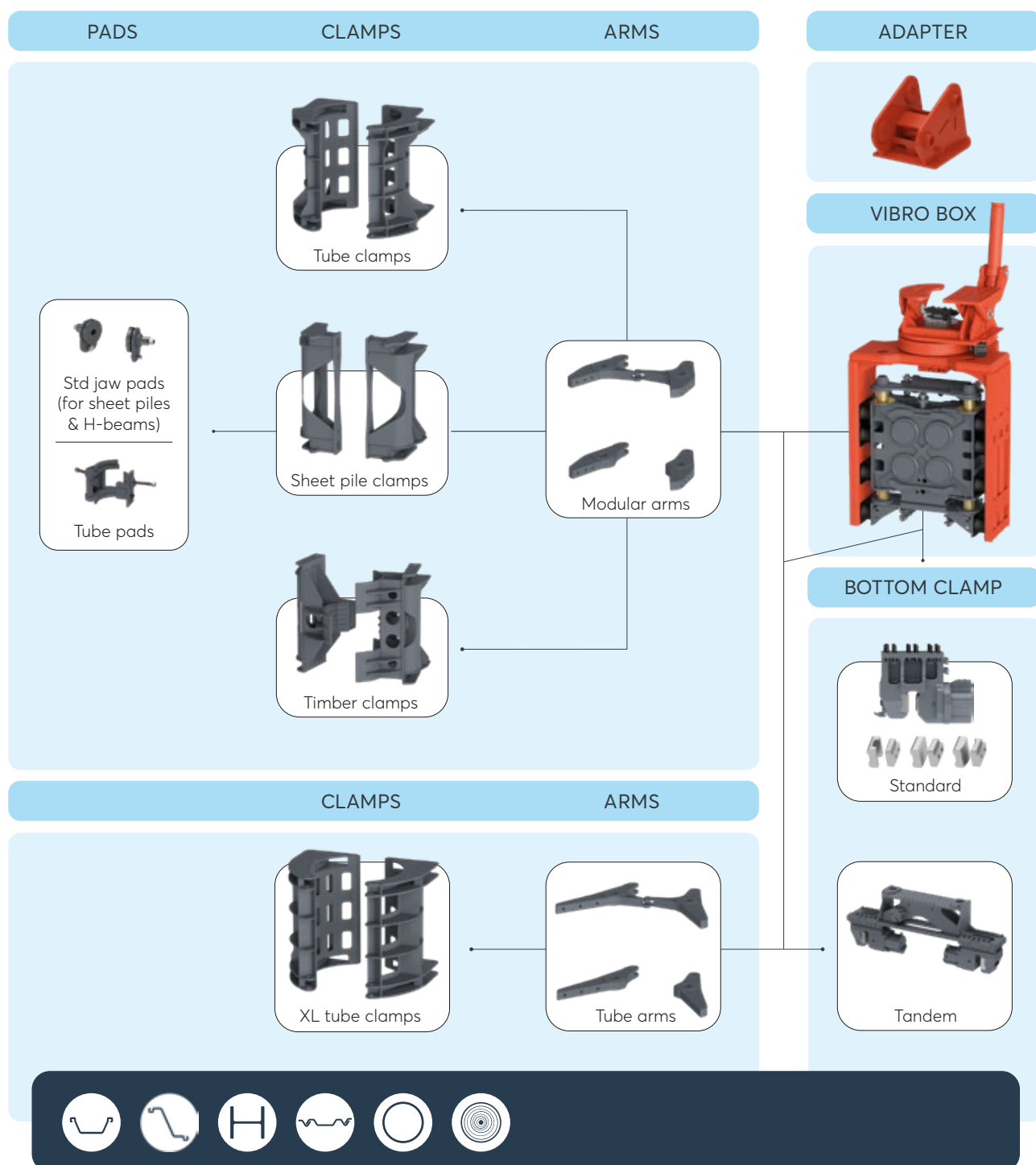
The Selection Chart provides the preliminary selection; When making the final selection the excavator engine size and hydraulic system design (oil pump arrangement, oil flow rate/pressure etc.), excavator lifting capacity and stability and soil and site conditions shall be taken into account.

SIDE GRIP VIBRATORY PILE DRIVERS

MOVAX MODULAR SYSTEM

Variable Active

The MOVAX Modular System (MMS™) enables the use of the same MOVAX side grip pile driver for a wide range of different type of piles ranging from sheet piles, H-beams and tubular steel piles to timber piles. The MOVAX Modular System includes interchangeable arms, clamps and pads that can easily and efficiently be changed for the different pile types in question.



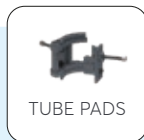
SIDE GRIP VIBRATORY PILE DRIVERS

MOVAX MODULAR SYSTEM

Variable Active

MODULAR ARMS

SHEET PILE CLAMPS



TUBE CLAMPS



TIMBER CLAMPS



TUBE ARMS

XL TUBE CLAMPS



SIDE GRIP VIBRATORY PILE DRIVERS

MODULAR ARMS

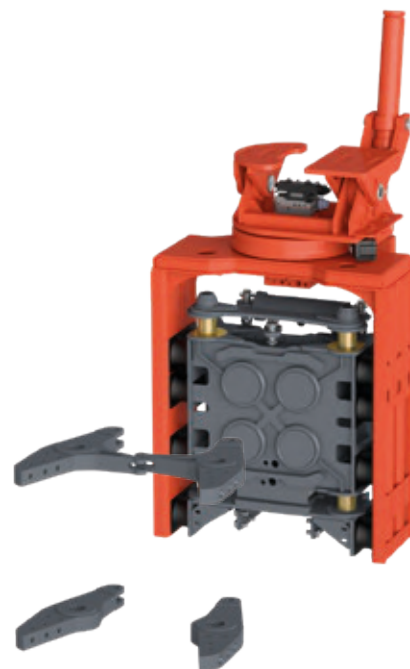
Variable Active

Modular arms are suitable for driving sheet piles, H-beams, tubular steel piles and timber piles.

Sheet pile clamps are utilised to drive sheet piles and H-beams. The sheet pile clamps can be equipped with tube pads for tubular steel piles up to OD 273 mm. Each tube size requires its own tube pads in order to ensure proper operation.

Tube clamps are utilised for tubular steel piles up to OD 762 mm. Each tube size requires its own tube clamps of matching size.

Timber clamps are utilised to drive timber or wooden piles. A range of round timber piles can be driven with the same timber clamps whereas square timber piles requires clamps of the same size.



TUBE CLAMPS

for tubular steel piles from
OD 88.9 mm up to OD 762 mm:

Standard sizes

Ø 88.9	Ø 168.3	Ø 457
Ø 101.6	Ø 219.1	Ø 508
Ø 114.3	Ø 273	Ø 610
Ø 127	Ø 323.9	Ø 711
Ø 139.7	Ø 406.4	Ø 762



SHEET PILE CLAMPS

Sheet pile/H-beam
w 400–1200 mm/H180–H500

Tube piles up to OD 273

Standard sizes

Ø 88.9	Ø 114.3	Ø 139.7	Ø 219.1
Ø 101.6	Ø 127	Ø 168.3	Ø 273



TIMBER CLAMPS

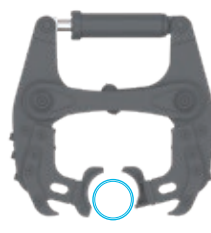
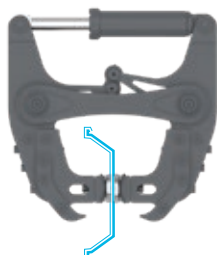
for timber piles from
OD 160 mm up to 600 mm

A range of timber pile sizes can be
driven with the same timber clamps.

Standard sizes

M Ø 160-420 mm
L Ø 430-600 mm

Customised sizes and special types, for instance for rail tracks, are available by request.



SIDE GRIP VIBRATORY PILE DRIVERS

TUBE ARMS

Variable Active

Special modular tube arms are utilised to handle and drive large diameter tubes from 508 mm up to OD 1220 mm. Each tube size requires its own tube clamp of the same size as the tube in order to ensure proper operation.

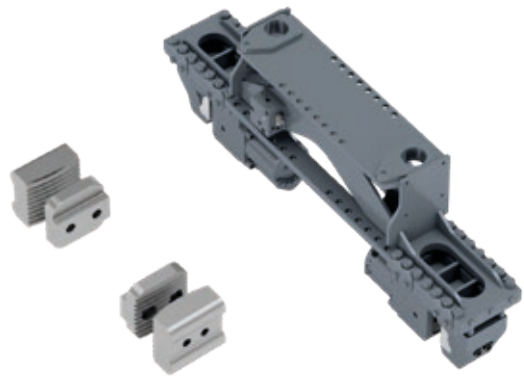
A tandem bottom clamp is available for the same tube sizes as the tube arms for optimised pile driving of large tubes. The same tandem bottom clamp can be used for the range of the different size tubular steel piles.



XL TUBE CLAMPS
from OD 508 to 1220mm

Standard sizes

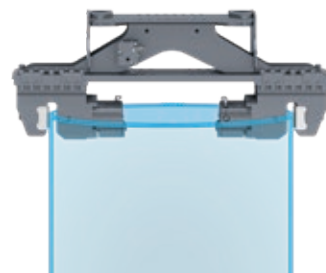
Ø 508	Ø 711	Ø 813	Ø 1016
Ø 610	Ø 762	Ø 914	Ø 1220



TANDEM BOTTOM CLAMP

Tube pads for tandem bottom clamp
from OD 508 mm up to OD 1220 mm.

TUBE ARMS are designed for the optimum handling, pitching and driving/
extraction of large OD tubes.



SIDE GRIP PILE VIBRATORY DRIVERS

BOTTOM CLAMP incl. options

Variable Active

The (standard) bottom clamp is utilised for the completion of the pile driving and is suitable for all kinds of piles including sheet piles, H-beams and tubular steel piles.

The bottom clamp is equipped with pads for the specific pile type in question, Sheet pile pads are utilised for sheet piles and H-beams, Double (sheet) pile pads are recommended when driving double sheet piles (both U and Z). Tube pads are available in two sizes, from OD 323,9 mm to 508 mm and OD 508 mm to OD 762 mm; both covering the entire range as specified.

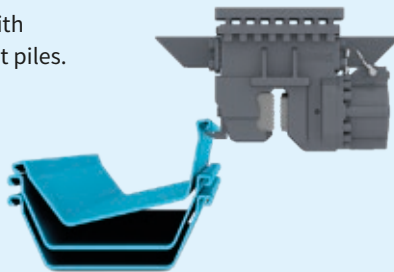
Smaller OD tube piles (from 88,9 mm to 323,9 mm and timber piles require a top hitter. The same top hitter is suitable for the entire range.

An optional handling jaws can be provided for added pile handling capabilities.



Lifting lever

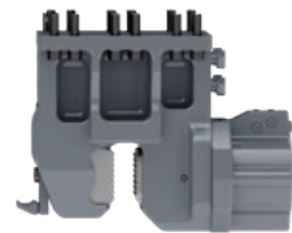
The bottom clamp is equipped with a lifting lever for handling of sheet piles.



Top hitter (optional)

Smaller OD tube piles and timber piles require a top hitter. The same top hitter is suitable for the entire range.

Top hitters for larger OD piles and f. ex. square timber piles are available by request.



Sheet pile pads

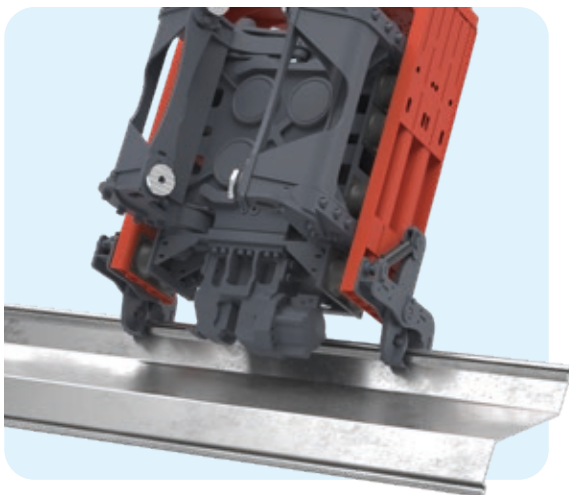


Tube pads
OD 323,9...508 mm
OD 508...762 mm



Double (sheet)
pile pads
Available for double-Z
type sheet piles





Handling jaws (optional)

Handling jaws are available with different type of inserts for optimised gripping of different type of pile profiles (both sheet piles and smaller OD tube pile piles).

SIDE GRIP VIBRATORY PILE DRIVERS

TECHNICAL DATA

Variable Active

Model		SG-80VA	SG-65VA	SG-50VA	SG-45VA
Weight (with sheet pile clamps, excl. adapter)	kg	3200	2550	2500	2490
Height	mm	2860	2840	2840	2840
Depth	mm	1295	1295	1295	1295
Width	mm	1230	1170	1170	1170
Frequency		38-50 Hz (2300-3000 RPM)			
Eccentric moment (max)	kgm	8,1	6,6	5,1	4,6
Centrifugal force (max)	kN	800	650	500	450
Ground vibration		Minimal			
Resonance free start/stop		Yes			
Active variable eccentric moment		Yes			
Swing/tilt angle	°	360/±45			
Pile length/weight		6 m / 2800 kg 12 m / 1900 kg 16 m / 1300 kg	8 m / 2300 kg 12 m / 1800 kg 16 m / 1200 kg	8 m / 2300 kg 12 m / 1600 kg 16 m / 1200 kg	
Return Pressure	bar	5			
Pressure setting	bar	350			
Excavator class	t	33-50	28-32	23-28	20-24
Engine power, min., TIER III	kW	180	135	125	100
Engine power, min., TIER IV	kW	200	160	135	120







HIGHER PRODUCTIVITY - SIGNIFICANT SAVINGS
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