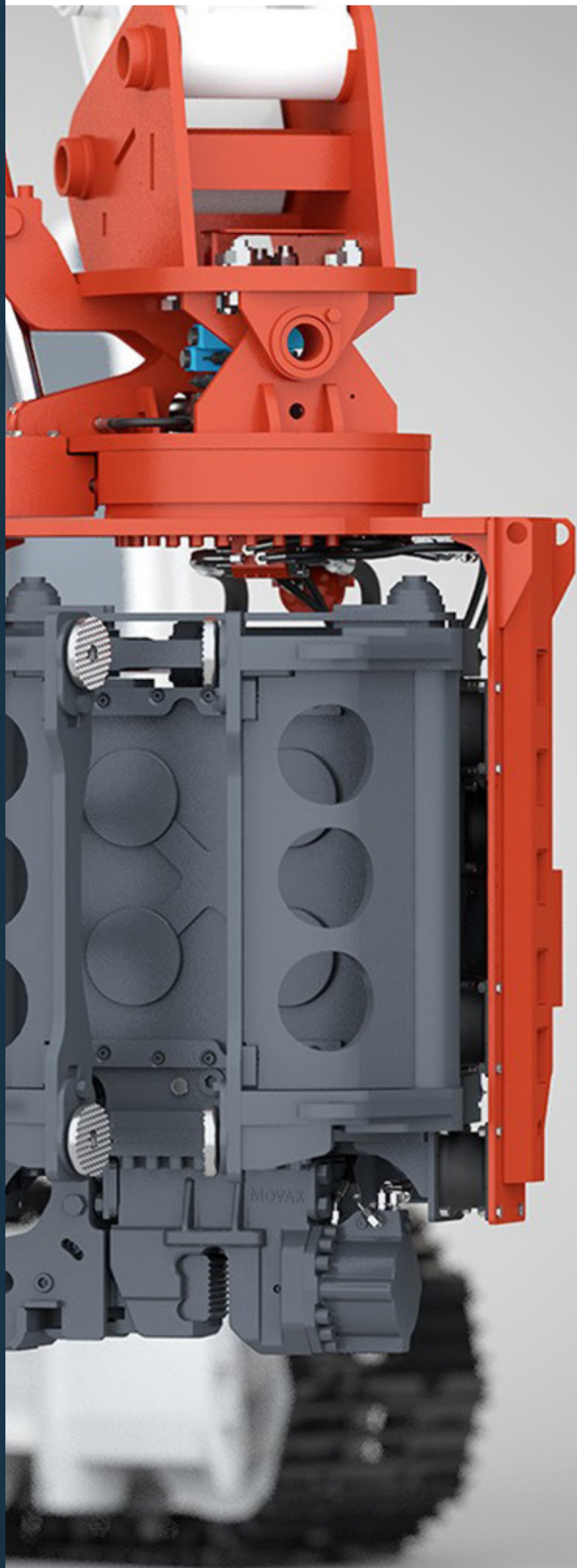




TECHNICAL SPECIFICATION

SIDE GRIP PILE DRIVERS



valid from July 2022



HIGHER PRODUCTIVITY – SIGNIFICANT SAVINGS

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

MOVAX WAY-OF-PILING

INTRODUCTION

Movax Oy, established in 1993, is a Finnish-based, privately-owned world-leading innovator, developer and manufacturer of excavator-mounted piling and foundation equipment with highly advanced automatic control systems and information management solutions.

A TOTAL SOLUTION

Movax Oy focuses solely on solutions for the piling & foundation industry. The comprehensive range of excavator-mounted piling & foundation equipment and customized solutions cover a complete range of piling technologies - including both driven and bored piles.

UNIQUE, VALUE-ADDING TECHNOLOGY

Movax Oy's piling and foundation equipment provide the optimum way-of-working - **MOVAX WAY-OF-PILING™** - when constructing foundations, building retaining walls, both temporary and permanent, cofferdams and when performing trenching and excavation work and soil stabilisation in a wide range of applications.

QUALITY BUILT-TO-LAST

MOVAX is made with high-class materials, equipment and components – and modern, state-of-the-art production technologies and machinery ensuring the highest possible quality of manufacture. Movax Oy's Quality Management Systems is certified on accordance with ISO 9001:2015.

GLOBALLY PROVEN

With almost **30 years of experience** and more than **2500 units delivered** to all over the world and with a clear focus on the piling and foundation industry, MOVAX has a deep understanding and know-how of varying site and soil conditions - and of all kinds of different type of excavators and rail roaders. Movax Oy's experience also covers a wide range of applications ranging from Rail, Road and Civil to Waterways & Piers, Utilities and Environmental & Energy.

GLOBALLY LOCAL CUSTOMER CARE

Movax Oy focuses on superior customer service and support together with a world-wide network of local partners, established in more than 30 countries all over the world, performing trenching and excavation work in a wide range of applications from civil/structural, rail and road to waterways & piers, utilities and environmental.



INNOVATION & CONTINUOUS DEVELOPMENT

Movax Oy is the inventor of the modular, vibratory side grip pile driver technology. Movax Oy's inventions have resulted in numerous patents (50+) and its trademark, MOVAX®, is registered and well known for the quality it represents all over the world.

Movax Oy is strongly committed to continuously develop its products and services in close cooperation with its customers and local partners.





PRODUCTS & SERVICES

VIBRATORY PILE DRIVERS

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.

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.

FEATURES



- **Excavator-mounted**
Utilizing the hydraulic power and lifting capacity of the excavator or rail roader (carrier). Designed to work on any and all wheeled and crawler-type excavators and rail roaders by utilising and commanding the standard auxiliary hydraulics and/or by connecting to the electronic control of the excavator.
- **Comprehensive 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; and for excavators ranging from 8 to 50 ton – thus always ensuring the optimum size and correct combination of vibratory pile driver and excavator.
- **Resonance-free**
Available with fixed eccentric moment or with resonance-free start/stop (V).
- **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.
- **MOVAX Control System**
Controlled with the MOVAX Control System, mControl+ for precision and accuracy.
- **MOVAX Information Management System**
Available with the MOVAX MIMS Information Management System: mFleetManagement for monitoring MOVAX piling equipment operation, performance and condition; and mLogbook for monitoring and reporting the piling works.

Side grip vibratory pile drivers for
HANDLING, PITCHING, DRIVING AND EXTRACTING PILES



SIDE GRIP PILE DRIVERS

SELECTION

The suitable MOVAX side grip pile driver-model is selected based on the soil & site conditions, the excavator and the main dimensions (weight & length) of the piles to be driven. The configuration is then defined by the type of piles.

Excavator (carrier)

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.

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.

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. Due to the modular design the same MOVAX side grip pile driver can be used to drive different type of piles.

Site conditions

MOVAX side grip pile drivers are the optimum solution for sites with limited access, space or headroom. Resonance-free models are selected for sensitive areas where disturbances to the surroundings are to be minimized.

SELECTION CHART (preliminary)

EXCAVATOR CLASS/ PILE SIZE (length/weight)	33-40 ton	28-32 ton	23-28 ton	20-24 ton	17-21 ton	13-16 ton	7-11 ton
6 m x 2800 kg 12 m x 1900 kg 16 m x 1300 kg	SG-75 SG-75V						
8 m x 2300 kg 12 m x 1800 kg 16 m x 1200 kg		SG-60 SG-60V	SG-50 SG-50V	SG-45 SG-45V			
6 m x 1200 kg 12 m x 1000 kg 16 m x 900 kg					SG-40N	SG-30N	
4 m x 400 kg 6 m x 200 kg							SG-15N
SUITABLE PILES							
Sheet piles / (trench sheets)*	width 400-1200 mm				width 400-1200 mm *(330-600 mm)		width 400-600 mm *(330-600 mm)
H-beams	H180-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

NOTE!

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 PILE DRIVERS

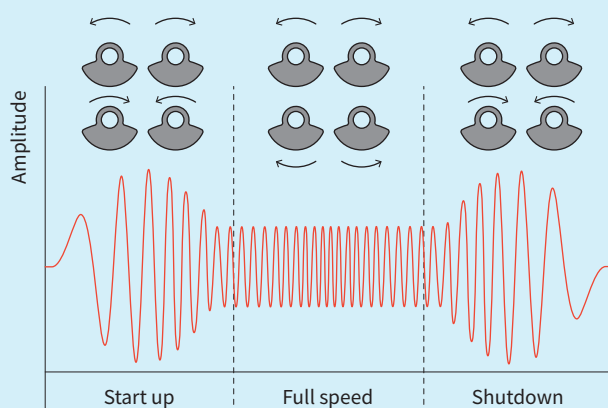
RESONANCE FREE

MOVAX side grip pile drivers are available in two different configurations: with fixed eccentric moment and resonance free (V-models).

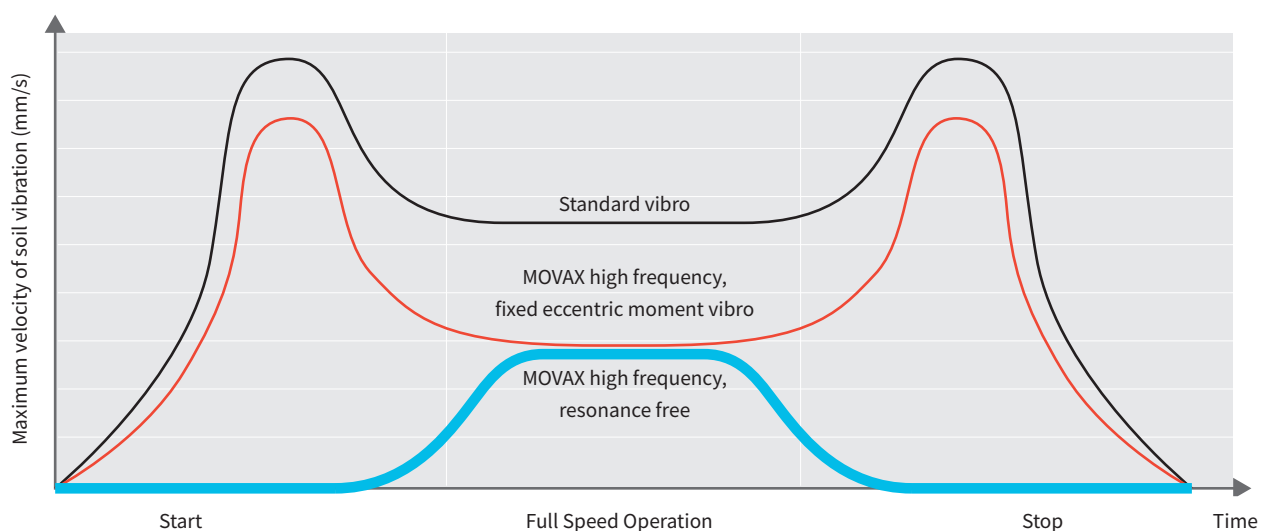
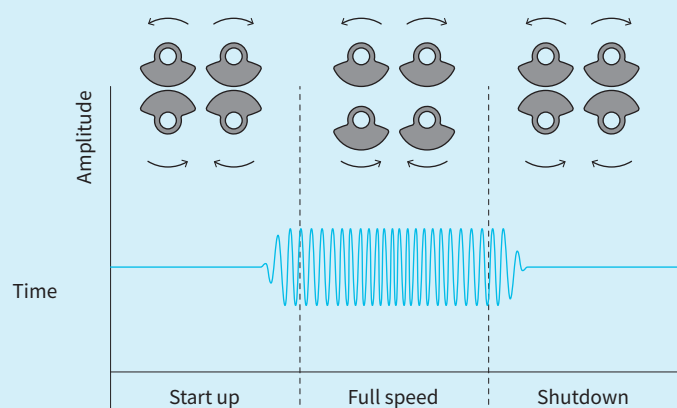
Disturbances to the surrounding environments can be minimised by operating at high frequencies (typically above 38 Hz) to avoid oscillation at the natural frequencies of the surrounding structures. MOVAX SG-V-models are high frequency (38–50 Hz) resonance-free vibratory pile drivers which allow starting up and shutting down the side grip pile driver without vibration.

This is achieved by shifting the upper row eccentrics with respect to the lower row eccentrics. The total eccentric moment of the side grip pile driver can be switched from 0% during start-up to 100% during operation and back to 0% during shut down, hence resonance-free. The resonance-free start-up and shutdown means that the SG-V-models are the ideal solution when working in urban areas or in sensitive environments. In addition to safer vibration, the SG-V-models also cause less noise and are faster and more comfortable to use.

STANDARD ECCENTRIC MOMENT SG-MODELS



RESONANCE FREE SG (V)-MODELS



MOVAX MODULAR SYSTEM

The diagram illustrates the components and assembly of the Vibro Box system, categorized into five main sections:

- PADS:**
 - Sheet pile/ H-beam: Small black components used for sheet pile or H-beam connections.
 - Tube (small OD tubes): Small black components used for tube connections.
- CLAMPS:**
 - Tube: A large black clamp component used for tube connections.
 - Sheet piles: A large black clamp component used for sheet pile connections.
 - Timber: A large black clamp component used for timber connections.
 - Tube: A large black clamp component used for tube connections.
- ARMS:**
 - Sheet pile: A large black arm component used for sheet pile connections.
 - Modular: A large black arm component used for modular connections.
 - Tube: A large black arm component used for tube connections.
- ADAPTER:**
 - VIBRO BOX: The main assembly, consisting of a large black frame with a red motor and a red arm, used for driving the piles.
- BOTTOM CLAMPS:**
 - Standard: Small black components used for standard bottom clamp connections.
 - Tandem: A large black component used for tandem connections.

Arrows indicate the assembly flow and connections between the various components.

The MOVAX side grip pile driver is always equipped with one arm/clamp system. The unit is equipped with either sheet pile arms, modular arms or modular tube arms, and the standard bottom clamp. The modular arms can further be equipped with clamps for sheet piles, tube piles or timber piles. The tube arms are equipped with the desired size tube pile clamps.

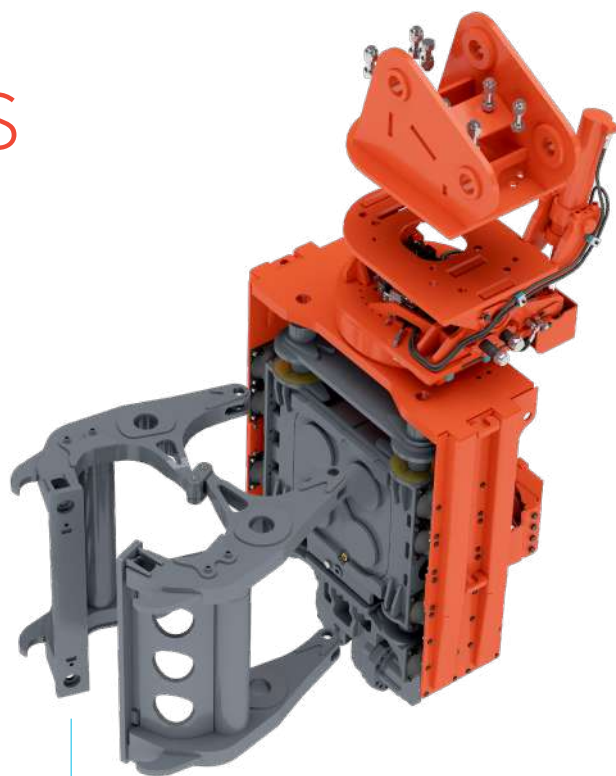
MOVAX MODULAR SYSTEM

SHEET PILE ARMS

Special sheet pile arms are the optimum solution when handling, pitching, driving and extracting only – or mainly – sheet piles and/or H-beams. The special sheet pile arms can also be utilised to drive smaller diameter tubular steel piles or micropiles up to OD 273 mm. Each tubular steel pile size requires its own, individual tube pads.

Sheet pile arms are available for MOVAX side grip pile driver models SG-45(V)...SG-75(V).

NOTE! Each tube size requires its own tube pads in order to ensure proper operation.



SHEET PILE PADS

for sheet piles and H-beams

Standard sizes

w 400–1200 mm / H100–H500



TUBE PADS

for tubular steel piles

from OD 88.9 mm to OD 273 mm

Standard sizes

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

Customised sizes are available by request.



CUSTOMISED PADS

for rail tracks etc profiles

Customised pads and sizes are available upon special request

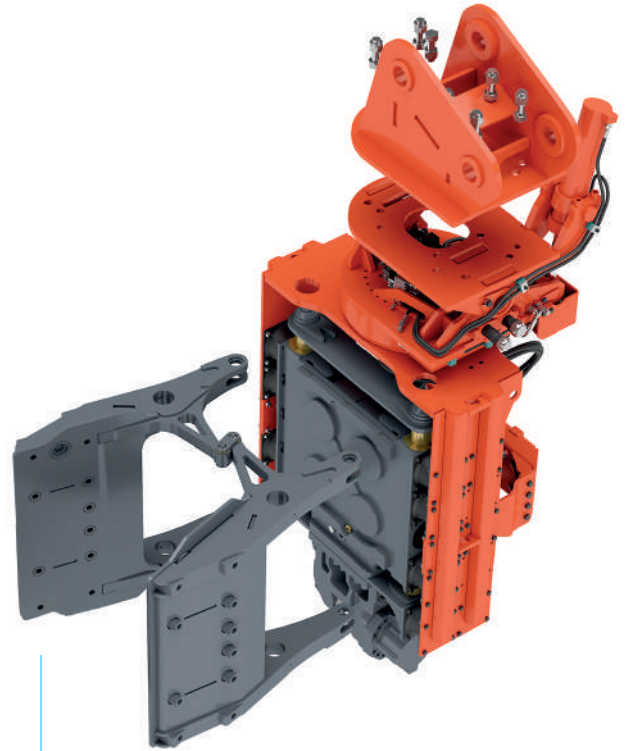
MOVAX MODULAR SYSTEM

MODULAR ARMS

Modular arms are suitable for driving sheet piles, H-beams, timber piles and tubular steel piles. Individual tube clamps are utilised for tubular steel piles up to OD 762 mm and Sheet pile clamps with Tube pads up for tubular steel piles up to OD 273 mm.

Modular arms are available for all MOVAX side grip pile driver models SG-15N...SG-75(V).

Note! Each tube size requires its own tube clamps/pads in order to ensure proper operation, whereas a range of timber piles can be driven with the same timber clamps.



TUBE CLAMPS

for tubular steel piles from OD 88.9 mm up to OD 323.9/508/762 mm:

SG-45(V)...SG-75(V)

Ø 88.9–762 mm

SG-30N...SG-40N

Ø 88.9–508 mm

SG-15N

Ø 88.9–323.9 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

Customised sizes are available by request.

TIMBER CLAMPS

for timber piles from OD 100/120/160 mm up to OD 300/325/600 mm:

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

Standard sizes

SG-45 (V) ... SG-75 (V)

Ø 160–420 mm & Ø 430–600 mm

SG-30N - SG-40N

Ø 120–250 mm & Ø 220–325 mm

SG-15N

Ø 100–200 mm & Ø 200–300 mm

Available also for square timber piles.

Customized sizes and e.g. clamps for square timber piles are available by request.

SHEET PILE CLAMPS

for sheet piles and H-beams/tubular steel piles from OD 88.9 mm to OD 273 mm:

SHEET PILE PADS

SG-45 (V) ... SG-75 (V)

w 400–1200 mm/H180-H500

SG-30N...SG-40N

w 400–1200 mm/H100-H400

SG-15N

w 400–600 mm/H100-H140



TUBE PADS

Standard sizes

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



CUSTOMISED PADS

for rail tracks etc profiles

Customised sizes are available by request.



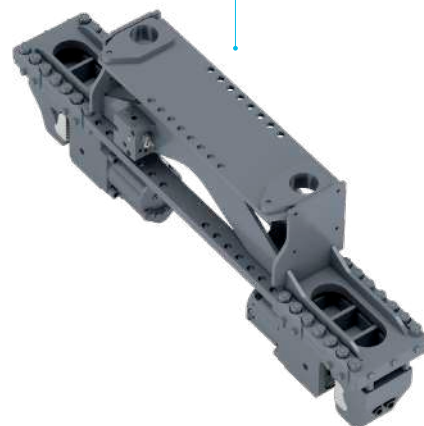
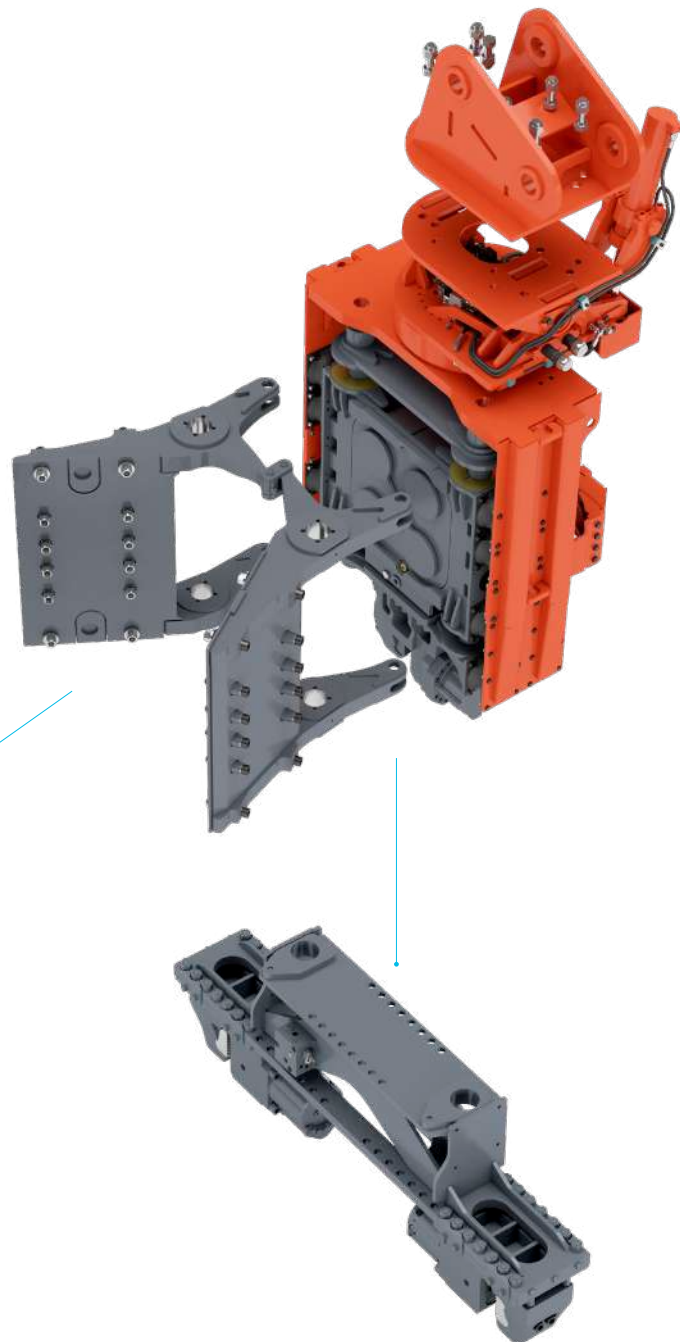
MOVAX MODULAR SYSTEM

TUBE ARMS

Special modular tube arms are utilised to handle and drive large diameter tubes from 508 mm up to OD 1220 mm. A tandem bottom clamp is available for the same tube sizes as the tube arms.

Tube arms are available for MOVAX side grip pile driver models SG-45(V)...SG-75(V)

NOTE! Each tube size requires its own tube clamp in order to ensure proper operation.



TUBE CLAMPS

for tubular steel piles from OD 508 mm to OD 1220 mm

Standard sizes

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

Customised sizes are available by request

TANDEM BOTTOM CLAMP

Available for MOVAX Side grip pile driver models SG-45(V)...SG-75(V)



TUBE PADS

Standard sizes

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

MOVAX MODULAR SYSTEM

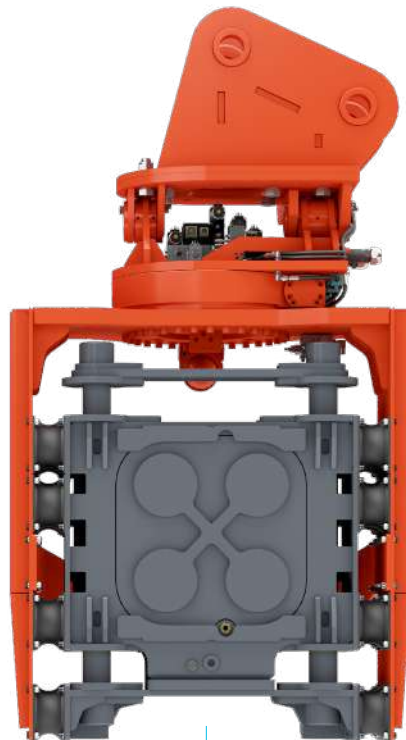
BOTTOM CLAMP

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.

A 4th jaw can be provided for added pile handling capabilities. The optional 4th jaw is available for model SG-45(V)...SG-75(V).



4TH JAW

optional, available for
SG-45(V)...SG-75(V)



SHEET PILE PADS



DOUBLE (SHEET) PILE PADS

Available for double-Z
type sheet piles



TUBE PADS

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



TOP HITTER

Standard sizes

OD 88,9...323,9 mm
(one size for full range)

Top hitters for larger
OD piles and e.g.
square timber piles are
available by request.



SIDE GRIP PILE DRIVERS

PILE HANDLING AND DRIVING

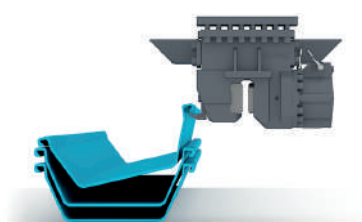
MOVAX side grip pile drivers are capable of handling, pitching, driving and extracting a wide range of different piles without manual handling or the need of assisting machinery or personnel.



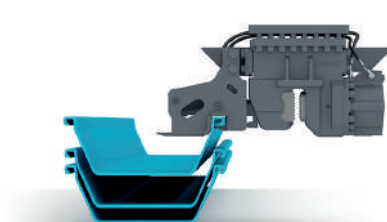
The MOVAX side grip pile driver is always equipped with one arm/clamp system. The arm/clamp system is selected based on the type of piles to be driven.

SHEET PILE ARMS

Special sheet pile arms are optimized for handling, pitching, driving and extracting sheet piles and H-beams (the sheet pile arms can further be equipped with tube pads for smaller OD tubes).



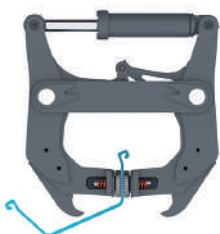
Lifting lever



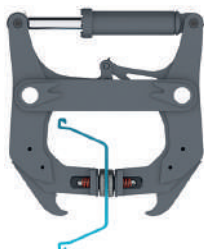
4th jaw (optional)



Clamp hooks



Clamping the web



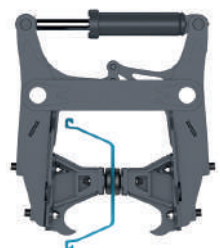
Handling/pitching/driving/extracting
(sheet piles)



Handling/pitching/driving/extracting
(H-beams)

MODULAR ARMS

Modular arms are designed for versatility and to handle, pitch, drive and extract sheet piles, tube piles or timber piles.



Handling/pitching/driving/extracting
(sheet piles)



Handling/pitching/driving/extracting
(tube piles)



Handling/pitching/driving/extracting
(timber piles)

TUBE ARMS

The tube arms are optimized for handling, pitching, driving and extracting larger tube piles.



Handling/pitching/driving/extracting
(tube piles)



SIDE GRIP VIBRATORY PILE DRIVERS

TECHNICAL DATA

SG (V) RESONANCE-FREE SERIES

Model		SG-75V	SG-60V	SG-50V	SG-45V
Weight	kg	3500 - 3750	2650 - 2950	2500 - 2800	2490 - 2790
Height	mm	2615	2550	2530	2530
Depth	mm	1115	1180 - 1436	1180 - 1436	1180 - 1436
Width	mm	1270	1193	1193	1193
Frequency	1/min	2300 - 3000	2300 - 3000	2300 - 3000	2300 - 3000
Eccentric moment	kgm	7,6	6,1	5,1	4,6
Centrifugal force, max	kN	750	600	500	450
Ground vibration		low	low	low	low
Resonance-free start/stop		yes	yes	yes	yes
Driving method		vibration	vibration	vibration	vibration
Swing/tilt angle	°	360/30	360/30	360/30	360/30
Return pressure, max	bar	5	5	5	5
Pressure setting	bar	350	350	350	350
Excavator class	t	33-40	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

Suitable piles					
Length & weight		6 m x 2800 kg	8 m x 2300 kg	8 m x 2300 kg	8 m x 2300 kg
		12 m x 1900 kg	12 m x 1800 kg	12 m x 1800 kg	12 m x 1800 kg
		16 m x 1300 kg	16 m x 1200 kg	16 m x 1200 kg	16 m x 1200 kg
Length & weight					
Sheet piles	width	400-1200 mm			
	depth	265 mm			
H-beams	size	H180-H500			
Timber piles	size	Ø 160 - 420 mm			
Timber piles	size	Ø 430 - 600 mm			
Tubular steel piles, tubes	size	Ø 88,9 - 762 mm (1220 mm)			



SG STANDARD SERIES

Model		SG-75	SG-60	SG-50	SG-45
Weight	kg	3330 - 3620	2550 - 2850	2400 - 2700	2390 - 2690
Height	mm	2615	2550	2530	2530
Depth	mm	1115	1180 - 1436	1180 - 1436	1180 - 1436
Width	mm	1270	1193	1193	1193
Frequency	1/min	2300 - 3000	2300 - 3000	2300 - 3000	2300 - 3000
Eccentric moment	kgm	7,6	6,1	5,1	4,6
Centrifugal force, max	kN	750	600	500	450
Ground vibration		normal	normal	normal	normal
Resonance-free start/stop		no	no	no	no
Driving method		vibration	vibration	vibration	vibration
Swing/tilt angle	°	360/30	360/30	360/30	360/30
Return pressure, max	bar	5	5	5	5
Pressure setting	bar	350	350	350	350
Excavator class	t	33-40	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

Suitable piles					
Length & weight		6 m x 2800 kg	8 m x 2300 kg	8 m x 2300 kg	8 m x 2300 kg
		12 m x 1900 kg	12 m x 1800 kg	12 m x 1800 kg	12 m x 1800 kg
		16 m x 1300 kg	16 m x 1200 kg	16 m x 1200 kg	16 m x 1200 kg
Length & weight					
Sheet piles	width	400-1200 mm			
	depth	265 mm			
H-beams	size	H180-H500			
Timber piles	size	Ø 160 - 420 mm			
Timber piles	size	Ø 430 - 600 mm			
Tubular steel piles, tubes	size	Ø 88,9 - 762 mm (1220 mm)			



SGN LITE SERIES

Model		SG-40N	SG-30N	SG-15N
Weight	kg	1505	1485	760
Height	mm	2042	2042	1500
Depth	mm	1138	1138	900
Width	mm	1030	1030	850
Frequency	1/min	2300 - 3000	2300 - 3000	2300 - 3000
Eccentric moment	kgm	4,1	3,1	1,6
Centrifugal force, max	kN	400	300	150
Ground vibration		normal	normal	normal
Resonance-free start/stop		no	no	no
Driving method		vibration	vibration	vibration
Swing/tilt angle	°	360/30	360/30	360/30
Return pressure, max	bar	5	5	5
Pressure setting	bar	350	350	300
Excavator class	t	17-21	13-16	7-12
Engine power, min., TIER III	kW	85	65	38
Engine power, min., TIER IV	kW	90	70	38

Suitable piles				
Length & weight		6 m x 1200 kg 8 m x 1000 kg 10 m x 900 kg	6 m x 1200 kg 8 m x 1000 kg 10 m x 900 kg	4 m x 400 kg 6 m x 200 kg
Length & weight				
Sheet piles	width	400 - 1200 mm	400 - 1200 mm	400 - 600 mm
	depth	260 mm	260 mm	140 mm
Trench sheets	width	330 - 600 mm	330 - 600 mm	330 - 600 mm
H-beams	size	H100-H400	H100-H400	H100-H140
Timber piles	size	Ø 120 - 250 mm	Ø 120 - 250 mm	Ø 100 - 200 mm
Timber piles	size	Ø 220 - 325 mm	Ø 220 - 325 mm	Ø 200 - 300 mm
Tubular steel piles, tubes	size	Ø 88,9 - 508 mm	Ø 88,9 - 508 mm	Ø 88,9 - 323,9 mm





HIGHER PRODUCTIVITY - SIGNIFICANT SAVINGS

fast. efficient. versatile. accurate. safe. reliable.

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