

# **FULL LINER** FOR PORT MATERIAL HANDLING MACHINES



38.5 – 420 t up to 42 m



# CONTENTS

#### **OUR PORT MACHINES**

Use our port solutions for efficient and precise work with the best overview.

- **04** ADVANTAGES OF SENNEBOGEN PORT HANDLING
- **14** SAFETY EQUIPMENT >
- **16** CO2 FOOTPRINT REDUCTION >
- 22 PRODUCT OVERVIEW >
- **28** AREAS OF APPLICATION >
- 41 PROJECT PLANER >
- **42** ABOUT SENNEBOGEN >
- **46** SERVICE & TRAINING >



Information and jobsite reports about the subject port you can also find at → sennebogen.com

# The right machine for every use

# 01 MODULAR DESIGN VERSATILE SOLUTIONS

"The maritime operations are certainly the most diverse and demanding applications in the off- and onshore sector. Thanks to the flexibility and decades of experience, SENNEBOGEN is always in a position to find individual solutions for our customers."

ROBERT AUMÜLLER
Head of business unit Port



"The port handling has already high importance and continues to grow, as is contributes significantly to the efficiency and sustainability of modern logistics processes. Our modular and energy-efficient handling machines are specially tailored to the requirements of ports and customers."

DMYTRO VAYSER Product manager Port



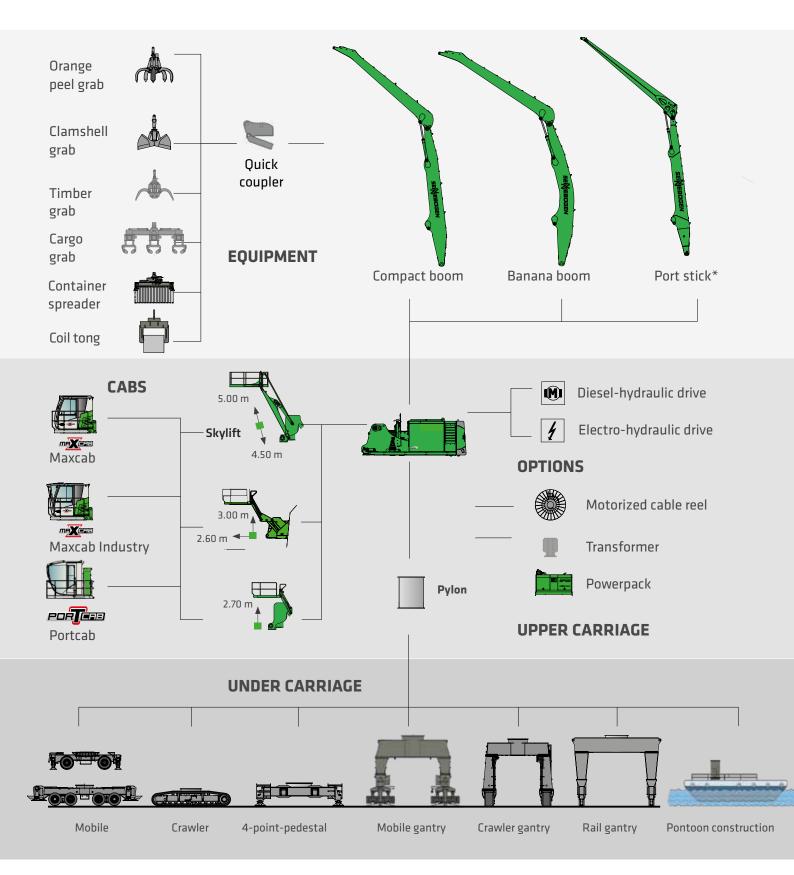
SPECIAL REQUIREMENTS?
WE HAVE THE SOLUTION.

With the proven SENNEBOGEN modular system we realise the machine that suits you best - perfectly customised to your application.

- We have already equipped your basic machine to the required standards in the habour area.
- Depending on the desired field of application and required reach, you can choose between different types of equipment.
- With additional options such as the quick coupler, the scales or Maxcab Industry you get exactly the port machine you need.



## **EQUIPMENT VARIATONS**



# O2 SPECIAL ATTACHMENTS FOR EVERY APPLICATION

Today general cargo, tomorrow bulk cargo - working in the port means staying flexible from day to day. The entire range of material handling technology can be flexibly operated using the quick change system on the stick and the SENNEBOGEN port machines' powerful hydraulics.





















# **MORE SAFETY**MAXIMUM COMFORT



#### Everything in view

The spacious cab with panoramic view gives you a practical overview of your work area. The window in the floor makes it possible to carry out precise loading operations even in close proximity. The safety cameras provide support and allow you to monitor the critical areas conveniently via the monitoring system in the cab.

#### Easy control

The intelligent SENCON control system gives you quick and easy feedback on the machine's condition. Thanks to the intuitive user interface, it has never been easier to monitor energy consumption and utilization, control the desired working modes and contribute towards reducing operating costs.

#### For your health

Operators spend many hours in their working position. The back-friendly comfort seat, adjustable armrests, joysticks that sit comfortably in the hand, and the optimally arranged controls make daily work as easy as possible.

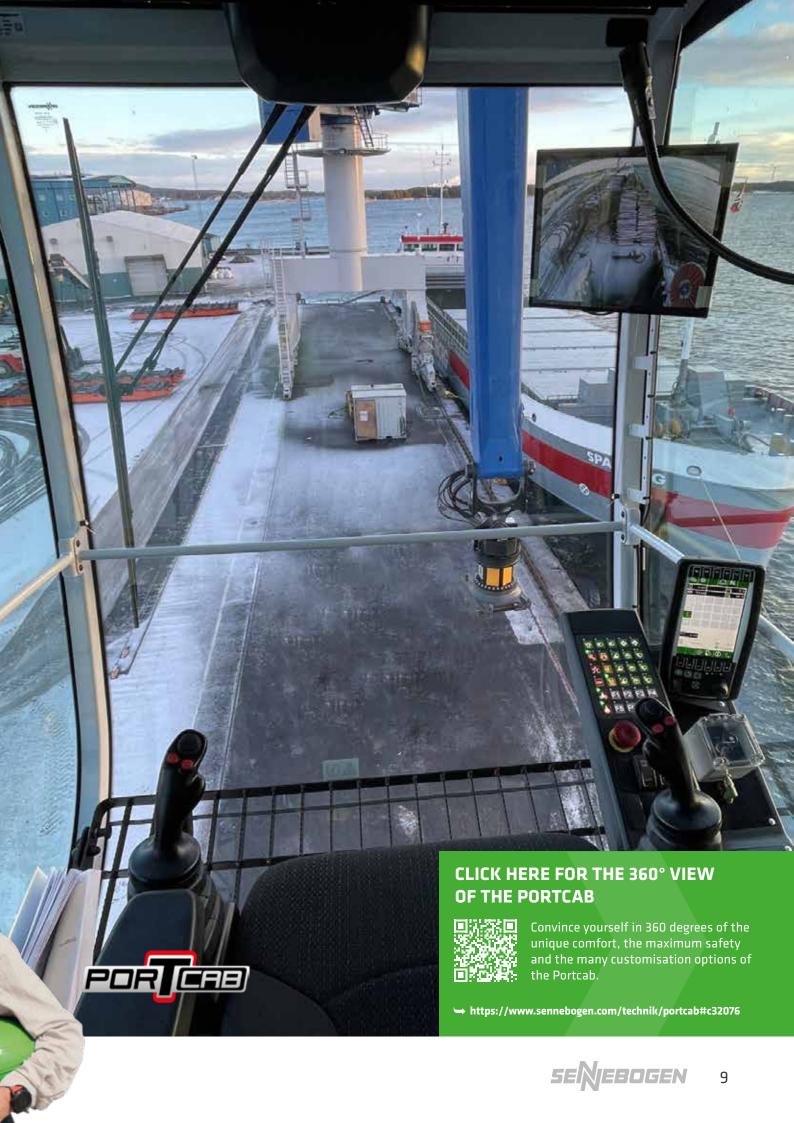
#### Pleasant indoor climate

Whether in warmer areas or in ports with sub-zero temperatures, you can enter a work space with a comfortable temperature on the essentials of work thanks to automatic heating and air conditioning.

"The development of the machine is based on user feedback in order to create the best operating experience."

ALI GÜLYAZ, Designer Material handling machines





## **CAB** HIGHLIGHTS



Maxcab



**Maxcab Industry** 

Sliding door incl. sliding window	Sliding door incl. sliding window	
Tinted safety glass	Undivided windshield made from buller proof glass, rigidly glazed	
Sky light made from bullet proof glass	Sky light made from bullet proof glass	
-	-	
Wipers for skylight	Wipers for skylight	
Wipers and washer system for front windshield	Wipers and washer system for front windshield	
Automatic heating/air conditioning with fresh air and recirculating air filter	Automatic heating/air conditioning wit fresh air and recirculating air filter	
Floodlights integrated into roof	Floodlights integrated into roof	
-	-	
✓	✓	
<b>√</b>	<b>√</b>	
	Tinted safety glass  Sky light made from bullet proof glass  -  Wipers for skylight  Wipers and washer system for front windshield  Automatic heating/air conditioning with fresh air and recirculating air filter	

AIR-CONDITIONED SEAT

COOLING BOX BEHIND THE OPERATOR'S SEAT

PROTECTIVE GRILLE ON SKYLIGHT AND WINDSHIELD

SUN PROTECTION PACKAGE

RADIO



# ALWAYS THE **RIGHT VIEW**

The large capacity cab for the best all-round view of the port

IN SERIES	PORTE
ENTRANCE	Easy access through wide cab door
OPERATOR' SEAT	Air suspended, with lumbar support, headrest and plenty ergonomic adjustments, heated
ARM AND FOOT RESTS	Easily adjustable, according to the user
WINDSHIELD	Generous windshield, tinted double glazing for safety windows
FLOOR WINDOW	Large safety glass floor window for best visibility into the hul
WIPERS	Parallelogram wipers for harsh weather conditions on the windshield
	Wipers for skylight
AIR CONDITIONER	Automatic heating/air conditioning with fresh air and recirculating air filter
LARGE 10,2' MONITOR	Camera-supported monitoring of the danger area (rear, right)
FOLDAWAY SEAT	Additional trainer's seat with seat belt
RADIO	✓
SENCON CONTROL AND DIAGNOSTIC SYSTEM	✓
OPTIONS	
AIR-CONDITIONED SEAT	✓
RADIO	✓
COOLING BOX FOR FOOD AND DRINKS	✓
SPEAKER SYSTEM	✓
SUN PROTECTION PACKAGE	✓



# O4 SPECIAL ATTACHMENTS WITH TOOL CONTROL

Our port material handlers set new standards in the use of different grabs and attachments. With the innovative Tool Control Technology, the hydraulic flow and hydraulic pressure are automatically adjusted to the selected tool - simply by making a selection in the cab.

## OPTIMAL PERFORMANCE FOR EVERY TOOL:

#### Individually programmable:

Tool Control saves specific parameters such as oil quantities and pressure for each attachment

#### Maximum efficiency and safety:

Each tool is individually configured and tested

#### Compatibility with quick-change systems:

For even more flexibility and easy change between tools

#### Your advantage:

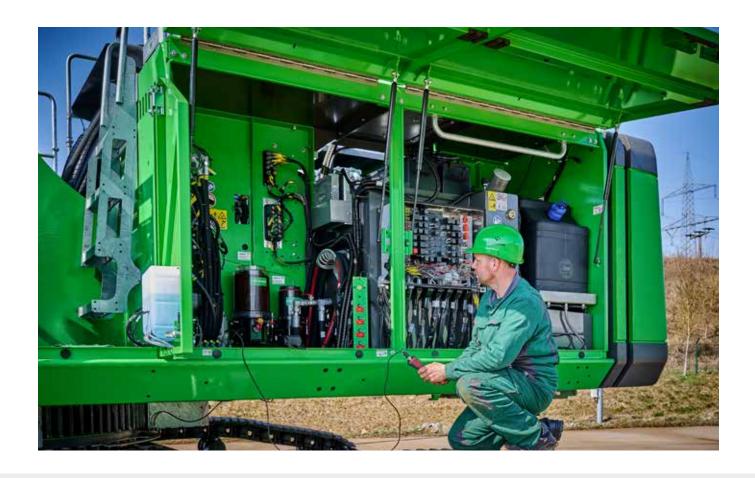
Perfectly harmonised hydraulic settings guarantee maximum performance, safety and efficiency in every application. Place your trust in our expertise - your solution for demanding handling tasks

The visual representation of the functions depends on the software version and may vary depending on the model.





# O5 MAINTENANCE AND SERVICE



# **KEEP IT SIMPLE.**MANAGEABLE TECHNOLOGY

All maintenance and service points are clearly arranged and easily accessible. The SENCON control system supports you with diagnostics. So your machine is back in action more quickly.



Reliable and practical technology



Stay independent, you can take care of your machine on your own



The central electrical distribution and electronic modules simplify maintenance

# **O6** SAFETY DEVICES IN FOCUS

Port handling involves challenging conditions such as tight spaces, poor visibility, a harsh climate and a high volume of different machines. SENNEBOGEN meets these challenges with sophisticated safety solutions that make heavy cargo handling efficient and safe at the same time. Each solution is designed to protect operators, ground staff and the entire working environment. In this way, we ensure that the handling of cargo in the port is quick, safe and reliable.





#### **ASCENT WITH SAFETY CONCEPT**

A well thought-out safety concept with acoustic warning signals, light and emergency stop switches, optional cameras and individual customization offers maximum protection.



#### LOAD MOMENT LIMITATION

The system monitors height, swing, and load limits in real time and automatically stops the machine to prevent damage.



Luis Technology GmbH

#### AI-BASED PERSON RECOGNITION

Cameras reliably detect people using artificial intelligence and provide multi-level warnings to prevent collisions.



#### **CABLE REEL MONITORING**

Automatic cable tension monitoring prevents slack and overtightening, reduces wear, and enhances operational safety.



## RAIL CONTACT SWITCHES FOR DECLERATION

Defined switch points along the rail ensure speed reduction and automatic shutdown, safely limiting the machine's travel path.



#### **COLLISION AVOIDANCE**

The radar reliably detects obstacles within 20 meters, even in poor visibility conditions, reducing the risk of collisions.



#### **CAB LOWERING SYSTEM**

Even in the event of a power or hydraulic failure, the cab can be safely lowered using the emergency release to ensure a secure exit.



#### **RAIL CLAMP**

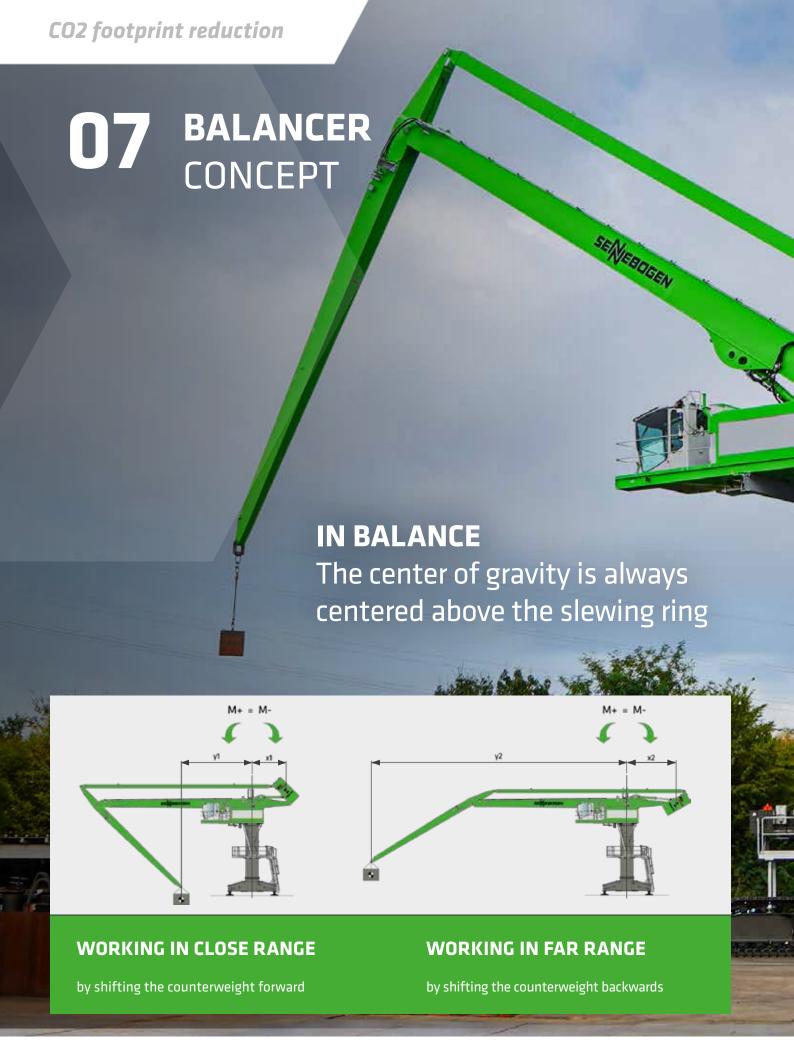
The holding force of the rail clamp prevents unintended machine movement, ensuring safety during idle times and maintenance work.

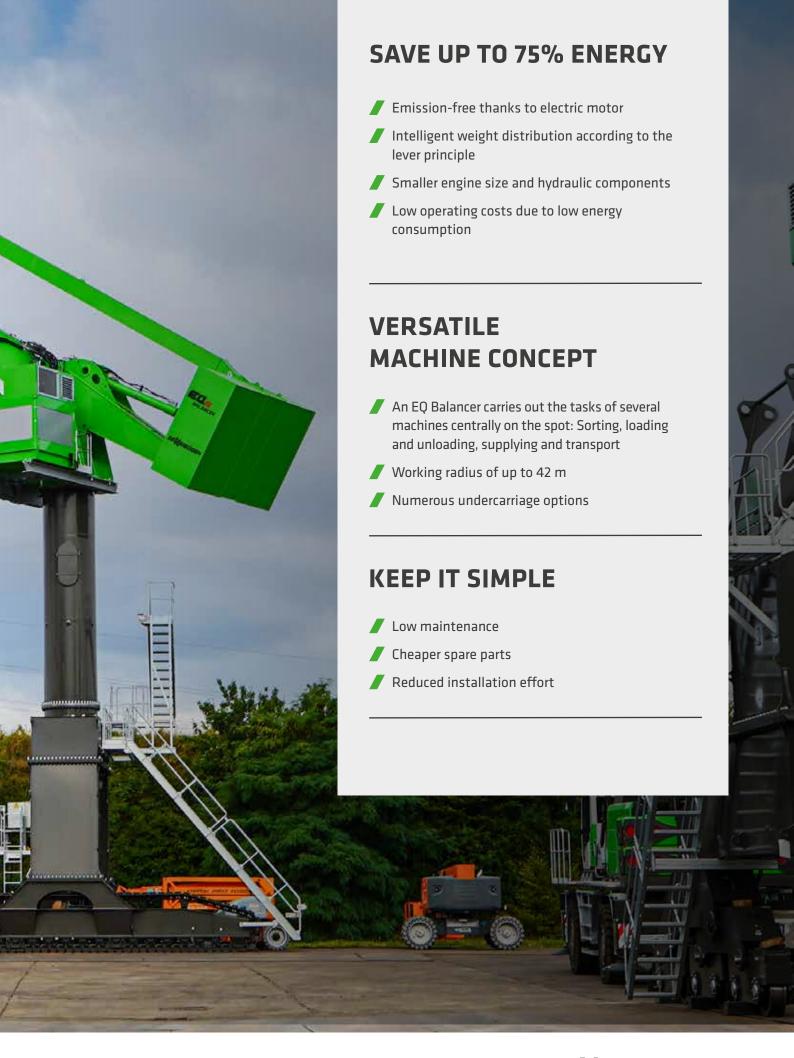




#### **EMERGENCY LIFT UNIT**

The emergency lift unit ensures reliable control of work equipment even in the event of engine or power failure, enabling safe positioning.





# 08 ELECTRIC SOLUTIONS WITH POWERPACK

#### **YOUR BENEFITS:**





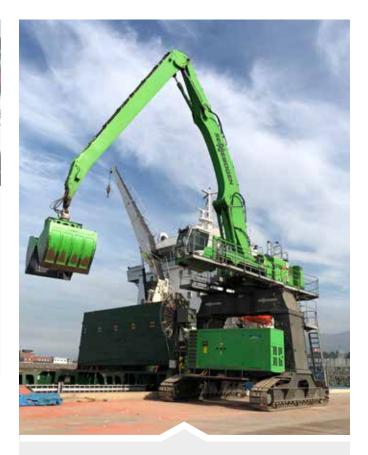
#### **EMERGENCY LIFT UNIT**

- The emergency lifting unit ensures maximum safety: it enables reliable positioning of the work equipment in the event of a malfunction
- Functions: Control of the attachment, stick, boom, and slewing



#### **POWERPACK SP100**

- The Powrpack SP100 ensures the mobility of electric machines, even without a continuous power supply
- Mobility: Enables the movement of crawler or mobile material handling machines independently of an external power source
- Robust: Durable and maintenance-friendly design for demanding operating conditions



#### **FULL-OPERATION POWERPACK**

- The full-operation powerpack offers maximum flexibility and ensures the complete operation of the machine in various applications
- Independence: Enables use in areas without an external power supply - ideal for changing job sites in ports
- User-friendliness: Easy operation with seamless switching between diesel and electric drive from the cabin
- Efficiency: Optimized engine, drive, and exhaust systems provide high performance with minimal fuel consumption

## **19** THE MOST SOPHISTICATED **ENERGY RECOVERY TECHNOLOGY** ON THE MARKET



Boom lowers, gas compresses



Energy storage module consisting of hydraulic cylinder and nitrogen accumulator



The nearly constant force transmission throughout the cylinder cycle supports the next boom lift

### SENJEBOGEN **GreenHybrid**

Protects the environment, saves energy, reduces your costs.

#### System advantages:

large system volume and constant force transmission over the entire cylinder cycle

#### System stability:

through constant pressure and temperature control

#### Functional safety:

Through the use of standard hydraulic components in the protected rear area of the machine

- System can be optimally adjusted to the individual task, depending on the weight of the material being handled
- Simple inspection and system filling via SENCON control system from the operator's seat

#### **GREEN HYBRID ENERGY RECOVERY TECHNOLOGY**



Energy recuperation through safe & smart design: watch the video to find out how the SENNEBOGEN Green Hybrid system makes port handling even more efficient.

https://www.sennebogen.com/green-hybrid

# 10 EFFICIENCY AND SUSTAINABILITY



#### LONG SERVICE LIFE, HIGH VALUE RETENTION

- Reliable and powerful thanks to its robust construction and high-quality components
- Temperature-controlled cooling system, designed and tested for heavy-duty applications and high ambient temperature

#### **EASY TO MAINTAIN AND SERVICE**

- Controllable technolgy and avoidance of over-engineering
- Ideal accessibility to all components for easy maintenance
- State-of-the-art engine, drive and exhaust systems according to the latest technology (Stage V)

## SOPHISTICATED, STATE-OF-THE-ART TECHNOLOGY

- Consistently designed for demanding material handling
- Increased efficiency thanks to G-Series hydraulics: optimized hose and pipe routing

## ENVIRONMENTALLY-FRIENDLY DRIVE TECHNOLOGY

Cleaner air with 50% less nitrogen oxides and up to 90 % fewer soot particles

# 11 HVO: HYDROTREATED VEGETABLE OIL

HVO (Hydrotreated Vegetable Oil) is a synthetic fuel derived from renewable raw materials. SENNEBOGEN machines with diesel engines are already fully compatible with HVO- without any modifications. With this innovative, climate-friendly fuel, our machines not only help reduce emissions but also support business in meeting future regulations. Choose sustainable solutions that combine performance and environmental responsibility.

#### **YOUR BENEFITS:**

#### Lower greenhouse gas emissions:

HVO diesel is made from renewable raw materials and can reduce greenhouse gas emissions by up to 90 %

#### Improved air quality:

This synthetic diesel burns cleaner, reducing fine dust particles and enhancing air quality with lower local emissions

#### **/** Future-proofing:

HVO support compliance with future regulations on greenhouse gas and pollutant reduction

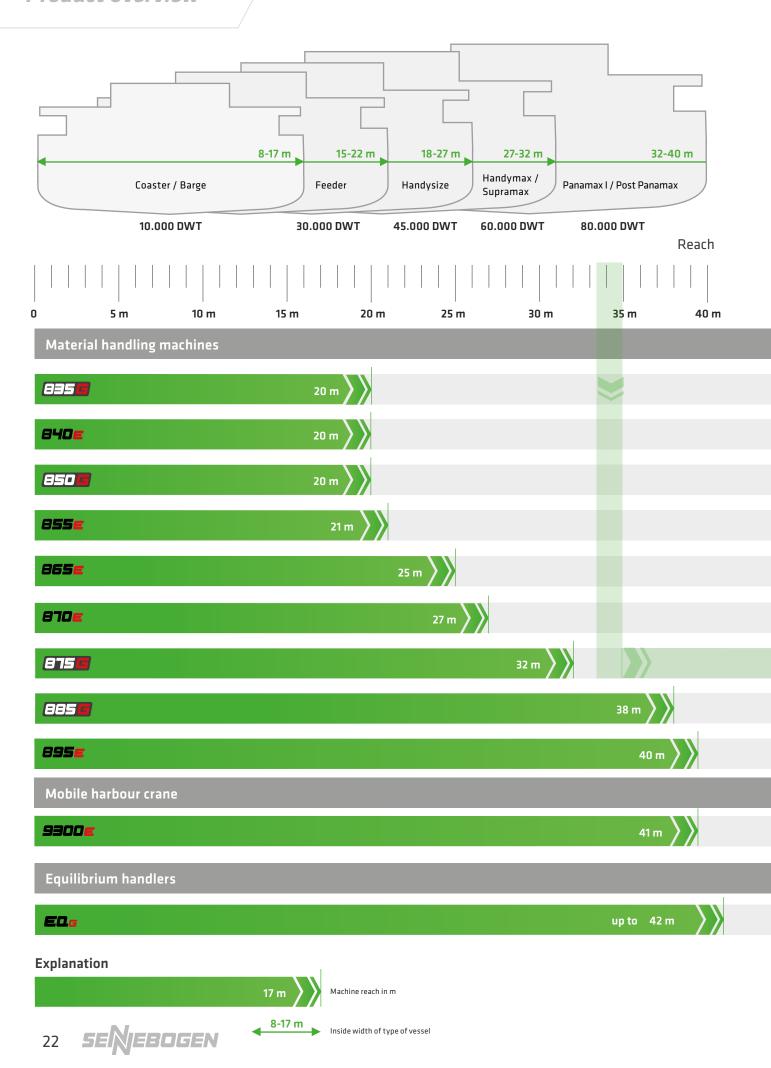
## Optimized engine performance and efficiency:

A higher cetane number ensures smoother engine operation, reduces wear, and improves cold-start capabilities

#### Compatibility:

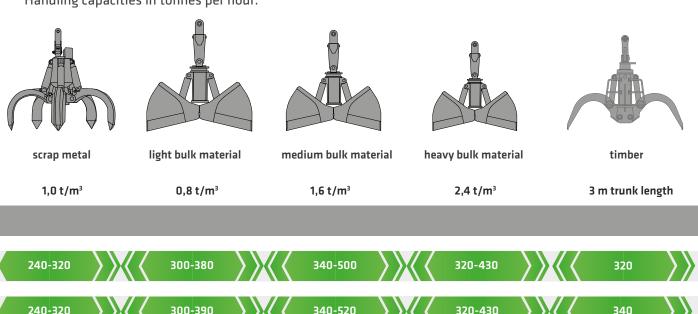
All SENNEBOGEN machines with diesel engines are already designed for HVO.\*





# THE RIGHT MACHINE FOR YOUR REQUIREMENTS

Handling capacities in tonnes per hour:





750-1000

on request

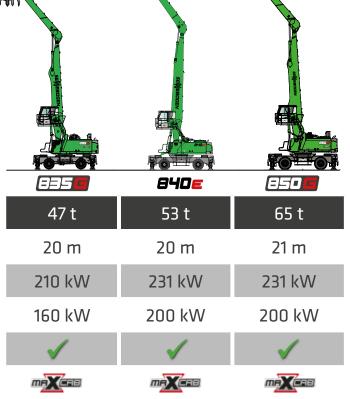


The shown lift capacities are orientation values that can be reached with grabs which are optimized for the machine. Actual lift capacities depend on the individual loading and unloading situation at the habour and result from different parameters (for example lift height, swing angle, form of ship, grab filling degree, grab).

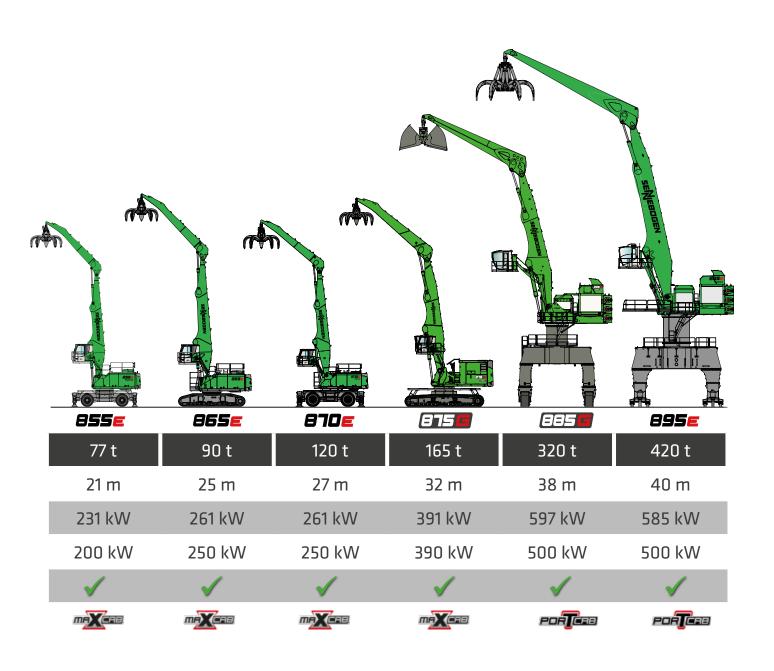


# **FOR EVERY PORT APPLICATION**THE RIGHT SOLUTION







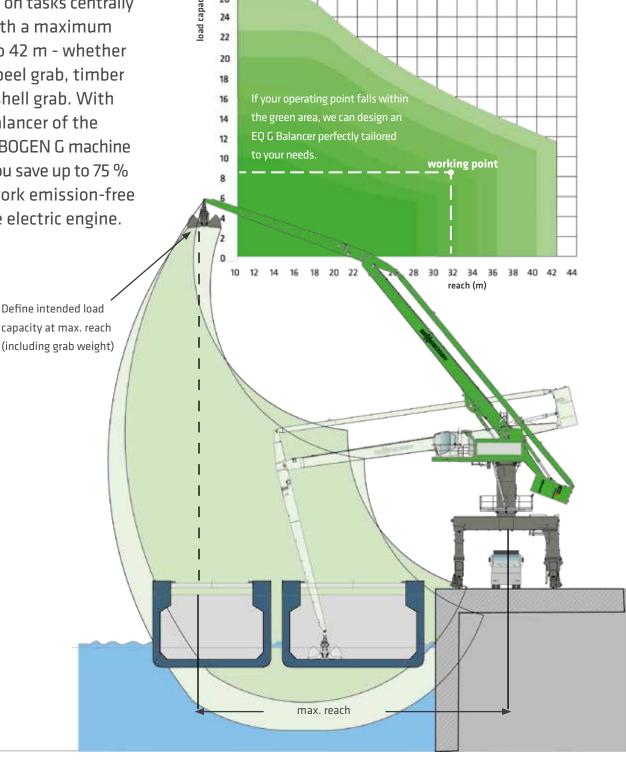


## **BALANCER EQ G-SERIES**

For demanding material handling in the port. The SENNE-BOGEN EQ G Balancer material handler takes on tasks centrally at the site with a maximum reach of up to 42 m - whether with orange peel grab, timber grab or clamshell grab. With the robust balancer of the latest SENNEBOGEN G machine generation, you save up to 75 % energy and work emission-free thanks to the electric engine.

Define intended load

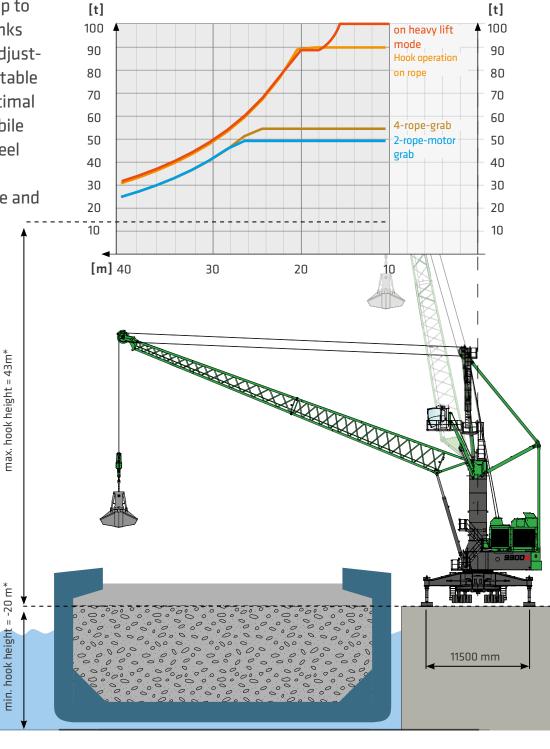




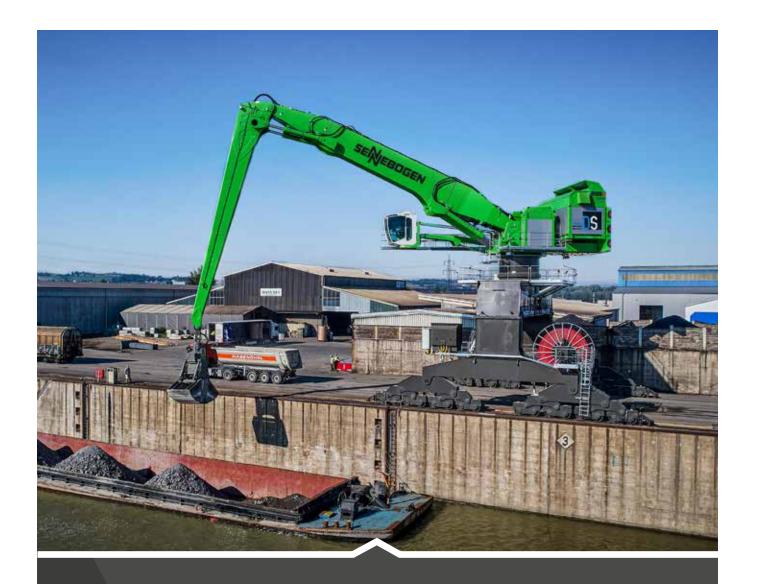
## HABOUR MOBILE CRANE

With a load capacity of 100 t at a reach of 17 m, the SENNE-BOGEN 9300 can be used for all ship sizes. The port crane loads and unloads ships up to Post-Panamax class. Thanks to its unique Skylift cab adjustment it provides a comfortable and safe access to the optimal working position. The mobile undercarriage with all-wheel steering and 14 whell sets ensures it is maneuverable and has low ground pressure.





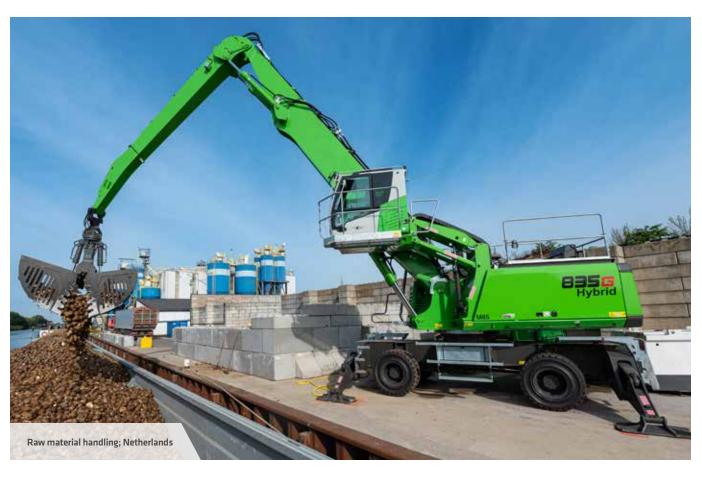
## **INLAND PORT**





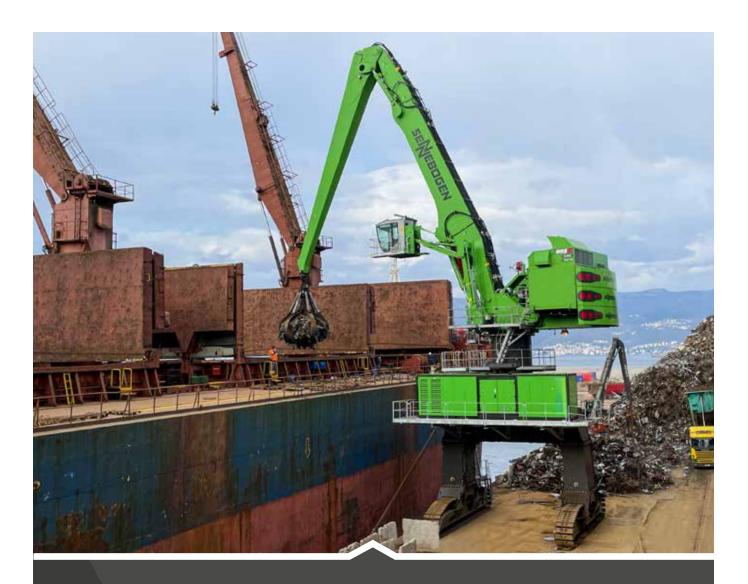
- High handling performance with low operating costs
- Maximum flexibility of attachments through quickchange systems

In inland ports, efficiency and versatility are key priorities. SENNE-BOGEN port machines are specifically designed for changing requirements and impress with their high handling performance while keeping operating costs low. Thanks to individual customization and compact design, they offer maximum functionality even in limited space.





## **SEA PORT**





- High handling performance with a reach of up to 42 meters
- Robust construction for durability

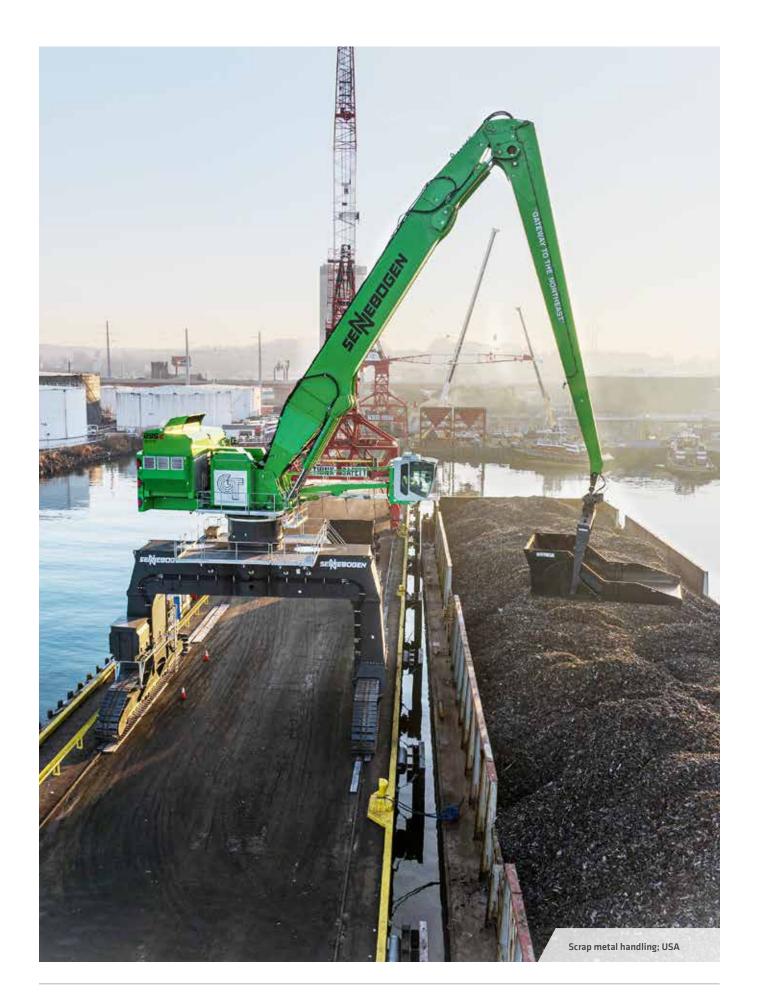
Seaports, as hubs of global trade, require high-performance machines for material handling. As a full-line provider, SENNEBOGEN offers a comprehensive range of solutions that impress with a reach of up to 42 meters and innovative efficiency. Robust constructions ensure durability, even under the toughest conditions.



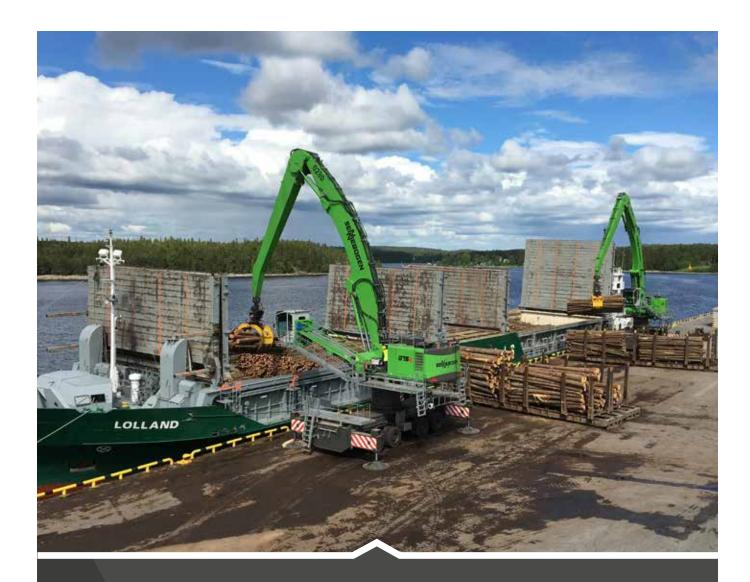








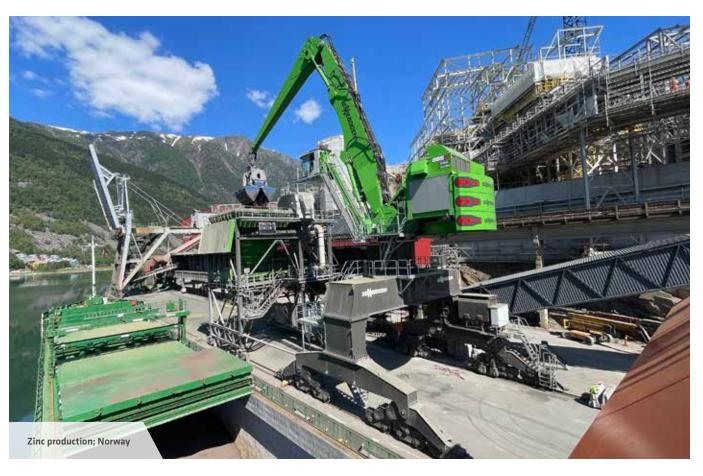
## INDUSTRIAL APPLICATION





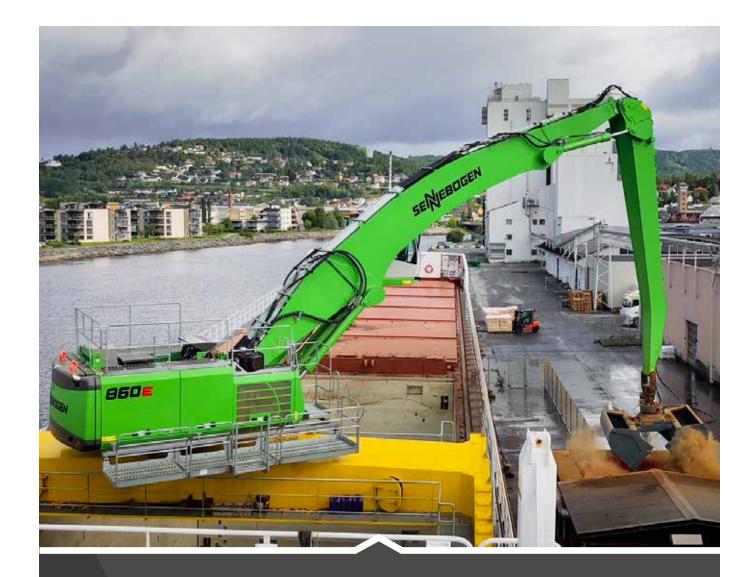
- Precise handling and versatile applications
- Highest safety standards

Whether in recycling, wood handling, or specific applications such as coil or big bag handling, SENNEBOGEN machines offer versatile solutions for industrial requirements. With their high load capacity, precise handling, and outstanding reliability, they guarantee efficient and safe operation.





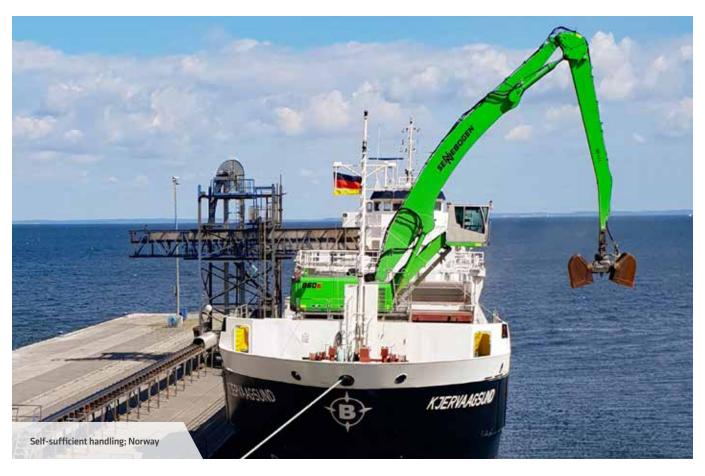
## **ONBOARD-LOADER**





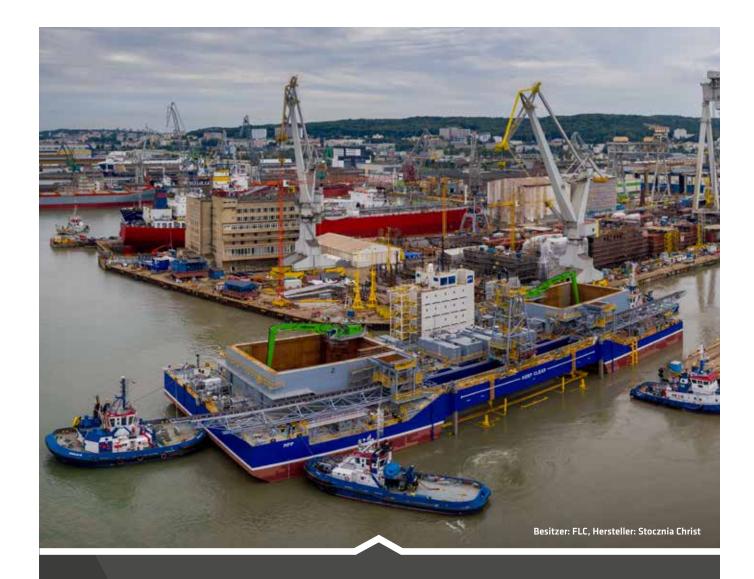
- Optimal integration into ship structures
- Safe material handling under all conditions

SENNEBOGEN machines for onboard-loader ships are optimized for seamless material handling. Their modular design allows perfect integration into the ship's structure, ensuring efficient and safe operation under all conditions.





### MARITIME ENGINEERING





- High reach for a variety of on- and offshore projects
- Corrosion-resistant coatings ensure maximum service life

For demanding maritime projects in both onshore and offshore environments, SENNEBOGEN offers customizable machine concepts tailored to specific construction and maintenance requirements. The modular design combines efficiency and flexibility—perfect for use in a wide range of maritime scenarios.





### Areas of application





# PROJECT **PLANNER**

А	ship width outside	т		
В	ship width inside	m		
С	ship's side height	т		4_4
D min	ship, fulll	т		
D max	ship, empty	т		
E	distance ship-pier	т	 	
Fmin	high tide	т		Â
Fmax	low tide	т		
G	distance machine - pier	т		
Н	height truck, hopper etc.	т		•
1	width truck, hopper etc.	т		
<i>a</i>	pivoting angle	т		
			<b>←</b> G →	<b>∦</b> \
<b>*</b>	n //	<del>*</del> []		
		<b>D</b> max	<b>¶ ∦</b>	
		<b>D</b> min	Fmax Fmin	
c ~~~~		<b>*</b>	***	
			<b>← E →</b>	
<b>\</b>				
	B — A —	<b>→</b>		
		'		

# WE ARE A FAMILY-OWNED COMPANY

WITH DECADES OF EXPERIENCE –
YOU CAN RELY ON OUR TECHNICAL SOLUTIONS.

Since 1952, we stand for customer-specific mechanical engineering and have successfully established ourselves as market leader in many industries of crane technology and demanding material handling worldwide.





# **WE STAND FOR**

#### STABILITY AND RELIABILITY

Our stable and continuous development results in maximum reliability and performance throughout the entire group.

#### ORGANIC GROWTH AND INDEPENDENCE

To us, this means focusing on the future. For our partners and customers, it stands for long-term reliability and security.

#### A STRONG HERITAGE SECURES THE FUTURE

Thanks to solid and strong financial management, the group of companies has developed into a leading manufacturer on the market. Continuous investment in our companies ensures that we remain ahead of the game.

#### PROXIMITY TO OUR PARTNERS

Meeting our customers, dealers, suppliers or employees in person helps us to improve every day.

# WORLDWIDE CUSTOMER FOCUS



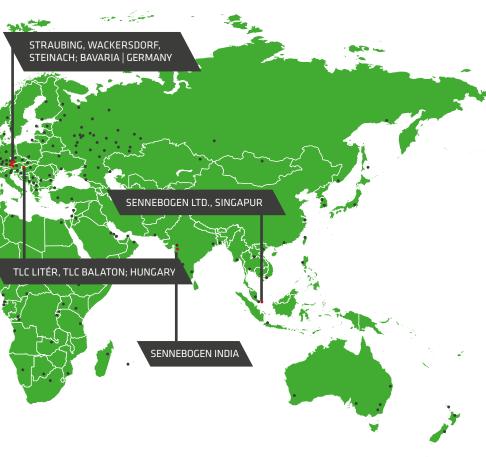








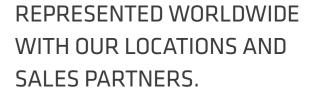
- Locations and branches
- Sales and service partners

















# **SENCON** The machine control of the future.

Diver comfor

AS BYOURS A

The modern SENcon control system offers comprehensive comfort for operators, fleet managers and service personnel.

Assistance systems increase work safety, make work processes more efficient and remote diagnostics quick and easy. Through the analysis of machine data, you can optimize the operation and reduce the  ${\rm CO_2}$  footprint of the machine.

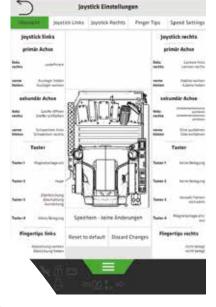
# 1. Driver comfort of tomorrow thanks to modern assistance systems

- ✓ Quickly setup & access to comprehensive driver profiles
- Integrated safety systems (e.g. work area limitation)
- Safe machine movements thanks to semi-autonomous movements
- Preparation for remote control and fully automated operation movements



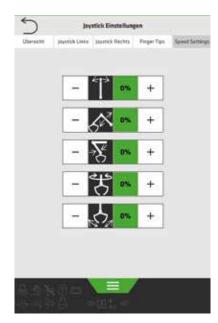
## 2. Effective remote service reduces costs and saves time

- Extract and analyze machine data from any location
- State-of-the-art diagnostic tool for effective remote diagnostics
- Guarantee of the best possible machine availability and operating safety



Machine data

Software updates



Quick access to all important functions via the touch display

# 3. Always up to date: Software updates over-the-air (SOTA)

- Efficient installation of new functions of the machine control system remotely without physical intervention in the machine
  - Continuous work with the latest technology
  - The machine remains maximally available and flexible in use



#### 4. Intelligent analysis of machine data

- In combination with the telematic system SENtrack the machine data from SENcon becomes valuable information about work processes and the condition of the machine
- Integrated functions such as the excavator scales ensure view of the current achieved handling performance
- Optimization of machines in use: simple and effective

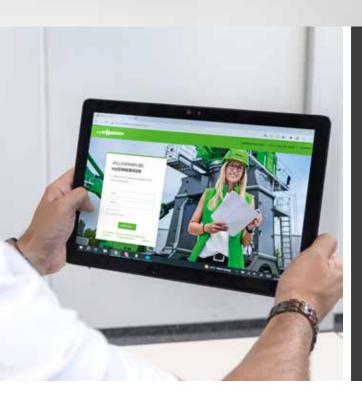
### **WE VALUE**

# **EXCELLENT SERVICE**

Even after purchasing a SENNEBOGEN machine, we offer our customers comprehensive services - everything from a single source.

Further information on our range of services can be found here.







Central portal to SENNEBOGEN's digital world

- **SEN**track
  - Telematic system for intelligent fleet management
- SENNEBOGEN TROUBLESHOOTER software solution for guided troubleshooting
- REMOTE SUPPORT
  Audiovisual guide for service technicians
- SUPPORT TICKET SYSTEM
  Intuitive ticket system for direct contact with service personnel
- FLEET MANAGEMENT
  Efficient monitoring of your machine fleet

#### WE ENSURE MAXIMUM AVAILABILITY.

With the Customer Service Center, we bundle all service activities centrally at one location. A tailor-made service offering for our customers is important to us.

■ SERVICE KITS – for easy and preventive maintenance
INSPECTION KITS – service package for the first 2,000

WARRANTY - component warranty can be selected indi-

vidually according to customer requirements

operating hours





The SENNEBOGEN Academy offers a wide range of training courses for operators of material handlers, telehandlers, cranes and duty cycle cranes – so that they can get the most out of their machines.

#### **OUR SENNEBOGEN ACADEMY OFFERS:**

- Operator training
- Driving licenses
- Technical training
- E-courses





## FLEET MANAGEMENT FOR PROFESSIONALS

#### **✓** 1. REDUCE SERVICE COSTS

Monitor the machine and its main operating parameters (temperatures, consumption). If key figures deviate significantly from the target value, the user is informed immediately.

#### 2. REDUCE CONSUMPTION

Easily identify and optimize idle times or change set parameters when machines are underloaded to reduce consumption.

www.sennebogen.com/sentrack

#### 3. IMPROVE PRODUCTIVITY

With just a few clicks, you can identify and optimize machine capacity, analyze routes and thus make your processes more profitable.

#### 4. SAFEGUARD YOUR INVESTMENT

Alarm messages inform you about critical machine conditions. In the event of irregular movements, the machine can also easily be deactivated remotely.



**73** over

years of experience

100%

family owned company

over **2200** 

employees worldwide

5

production plants in Germany

over 180

sales and service partners worldwide

27

different material handling machines



Telehandler 4-6 t Balancer 130-300 t Material handler

Duty cycle crane 13.5-300 t

Crawler crane 50-200 t

Telescopic crane
16-200 t

Port crane

This catalog describes machine models, the scope of equipment of individual models, and configuration options (standard equipment and optional equipment) of the machines delivered by SENNEBOGEN Maschinenfabrik GmbH. Machine illustrations may contain optional and supplementary equipment. Actual equipment may vary depending on the country to which the machines are delivered, especially in regard to standard and optional equipment. All product designations used may be trademarks of SENNEBOGEN Maschinenfabrik GmbH or other supplying companies, and any use by third parties for their own purposes may violate the rights of the owners. Please contact your local SENNEBOGEN sales pvartner for information concerning the equipment variants offered. Requested performance characteristics are only binding if they are expressly stipulated upon conclusion of the contract. Delivery options and technical features are subject to change. All information is supplied without liability. Equipment is subject to change, and rights of advancement are reserved. © SENNEBOGEN Maschinenfabrik GmbH, Straubing, Germany. Reproduction in whole or in part only with written consent of SENNEBOGEN Maschinenfabrik GmbH, Straubing, Germany.



#### SENNEBOGEN

Maschinenfabrik GmbH

Hebbelstraße 30 94315 Straubing, Germany **↓** +49 94 21 540-0



#### SENNEBOGEN LLC

1957 Sennebogen Trail Stanley, North Carolina 28164, USA

**\** +1 704 347-4910

**Sales**@sennebogenllc.com www.sennebogen-na.com

#### **SENNEBOGENPte. Ltd.**

25 International Business Park # 04-11/12 German Centre Singapore 60 99 16

**\** +65 6562 826-0

 info@sennebogen.asia www.sennebogen.asia

**MOVE BIG THINGS**