

# DELMAG Drill Rigs RH Models



# DELMAG Drill Rigs

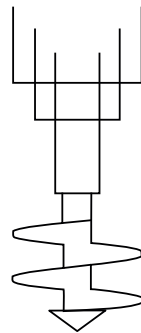
Ever since 2000, ABI in Niedernberg, Germany has continued the long tradition of producing DELMAG drill rigs.

The drill rigs are built in small production series or individually according to customer requests. When designing the concept, the focus is always on optimum performance with the greatest possible reliability and durability. The solid construction of the components achieves a high degree of rigidity and stability.

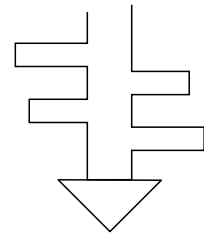
The existing models are continuously being developed and adapted to the needs of the customers.

DELMAG drill rigs are often used for the production of cased and uncased drilled piles sometimes called drilled shafts or piers, using the Kelly drilling method, also for drilled piles with endless or full displacement auger (CFA) as well as for soil mixing and for the VDW method.

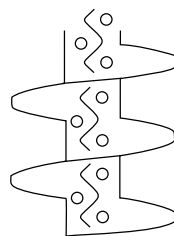
Kelly drilling



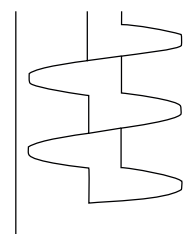
Soil Mixing

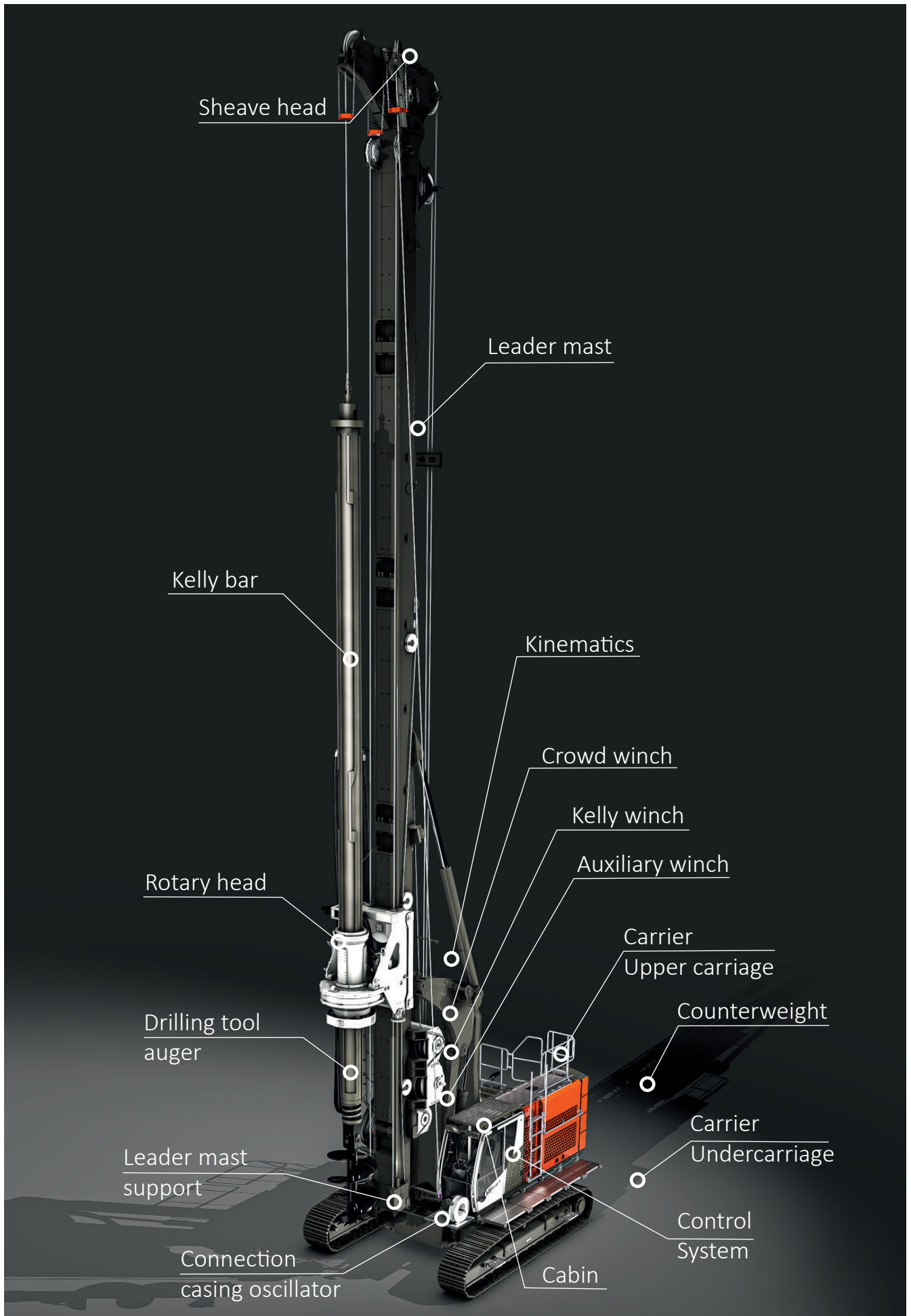


CFA drilling

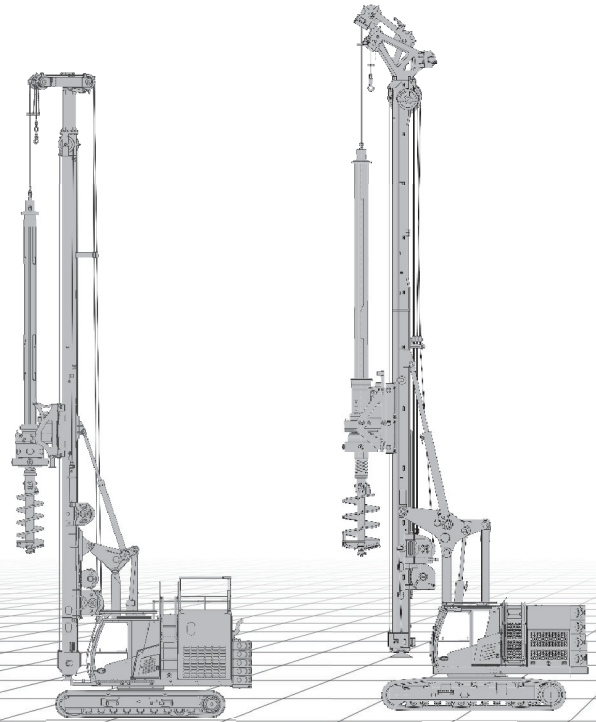


VDW drilling





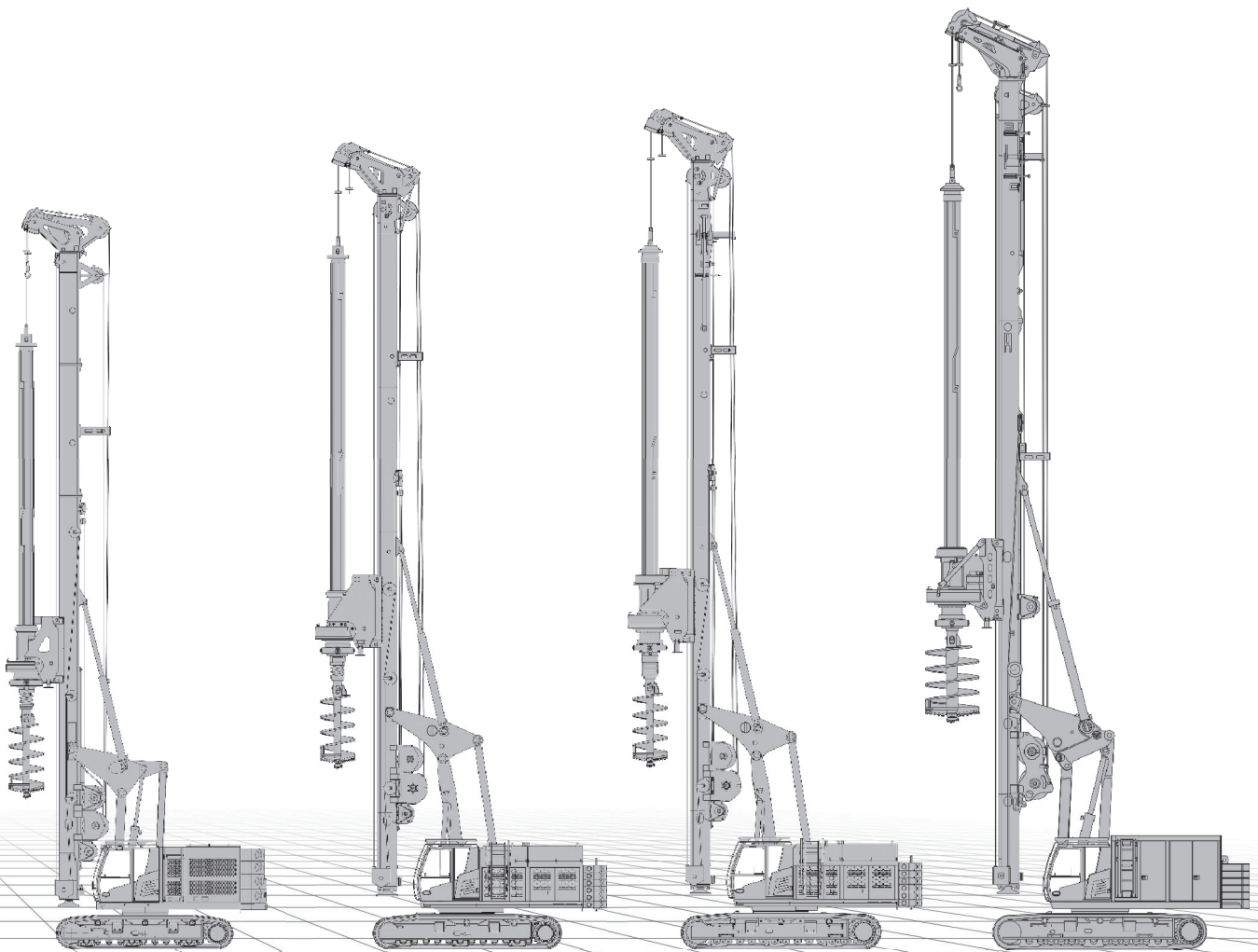
# Overview



Model		<b>RH 14</b>	<b>RH 20</b>
Engine power	kW	209	280
Drilling depth up to <sup>1</sup>	approx. m	23	30
Free diameter in front of the rope pulleys	mm	1500	1600
Stroke rotary head	mm	12000	12400
Crowd system		Winde	Winde
Torque rotary head up to	kNm	143	196
Operating weight <sup>2</sup>	approx. t	45	64

<sup>1</sup> drilling depth depends on installed Kelly bar,

<sup>2</sup> with rotary head and standard Kelly bar, without drilling tools



RH 27	RH 34	RH 38	RH 50
310	400	400	470
40	52	60	60
1960	2170	2170	2800
16650	17500	18350	19500
Winde	Winde	Winde	Winde
270	336	375	507
81	97	109	134



# Control System

The control system is the link between man and machine, and in modern construction machinery it is one of the most important components, as it decisively influences the efficiency of the machine.

In its products ABI relies on a decentralised control system as well as on integrated systems. The decentralised control system with short signal paths enables precise control

of the numerous functions, and also offers the necessary flexibility in the realisation of customer-specific requirements.

The operating concept of the ABI and DELMAG machines supports the driver in his daily work with helpful functions and options. Special emphasis was taken on ergonomic controls and a procedure-based menu structure.



## **Automatics and working modes**

The automatic alignment system enables the leader mast to be precisely aligned. With the help of the automatic position return function, the saved drill hole position can be relocated again with pinpoint accuracy with the drilling tool. The rope monitoring mode monitors the rope tension, automatically tensioning the Kelly rope and thus contributing to less wear on the rope.

When Kelly drilling, the spin off automatic mode can be switched on to shake off the spoil from the drilling tool. The change in direction takes place automatically; the driver controls the speed using the joystick. The casing can be extracted with the help of the automatic oscillation; the casing is extracted at a constant speed with alternating directions of rotation.

When working with aggregates, various automatic functions are available for the concreting process. In the automatic function speed mode, a constant speed for the extraction is set. In the automatic function pressure and flow rate modes, the extraction speed is controlled according to the concrete pressure or quantity in order to achieve the desired pile quality.

## **Data recording**

The data acquisition is integrated in the DELMAG control system. While CFA drilling the process data, e.g. working pressure, crowd pressure, concrete pressure etc., are shown and stored on the main display. With the optional data collecting and recording, the data can be transferred via USB stick or via the web based ABI customer portal and evaluated and archived on a computer with the corresponding software.

## **Fleet management**

Fleet management is carried out via the ABI customer portal. With a personalised login, machine parameters such as machine location, operating hours, fuel consumption etc. can be viewed online at any time. If the machine is equipped with data recording, the stored process data can also be downloaded.

## **Start-Stop button**

Environmentally aware control of the machine is facilitated by a start-stop button. Using the start-stop button the diesel engine can be stopped for longer periods without the control system being switched off. On restart the system is immediately returned to the same settings as before. This reduces noise emissions and saves fuel.

## **Battery management and side lighting**

The battery management system ensures high availability of the battery and makes the battery disconnecter easier to use. The exhaust emissions after-treatment does not allow the battery to be disconnected directly after the diesel engine has been switched off. The battery management automatically takes over this function. In addition, the battery management system can be coupled with the side lighting and enables the driver to enter and leave the machine safely in the dark.

## **Remote control**

New machines are equipped with the radio remote control „loading mode“ as standard, so that the driver carries out and controls the loading process from outside. As an option, the machine can be equipped with the more comprehensive radio remote control „set-up mode“. This allows all functions necessary for the set-up process to be operated from outside. Both radio remote controls also serve as emergency operating units.

# Operating

## **Main and auxiliary display and function controller**

The main display serves as a display for process and engine values as well as for process selection. The auxiliary display and the function controller are used to control the working process and to enter the target or limit values. The selection of buttons is dynamic, always related to the selected working process. The driver can adjust the position of the two displays individually, so that the important values are always in sight but do not obstruct the view to the working area.

## **Joysticks**

The sensitivity of the joysticks is individually adjustable. In addition, the driver is informed of important machine messages via vibration feedback. For example, a vibration alarm alerts the driver that a limit stop has been reached.

## **Cabin with comfort seat**

The air-conditioned cabin offers the driver a lot of comfort. The seat has air suspension as standard and is equipped with a lumbar support, headrest and seat heating.





# Service

A high availability of machines is decisive for economic efficiency, which can be maintained by regular inspections and efficient troubleshooting.

The ABI mechanics and technicians regularly perform prescribed checks and inspections on DELMAG drill rigs, eliminate errors or repair damages that can occur due to the rough work environment and demanding methods of the machine.

Due to the fast availability of spare parts and reliable support downtimes are minimized and a smooth and profitable operation of the machines is ensured.



# Rotary Head

DELMAG rotary heads are **powerful, robust and quiet**. The speed and torque can be continuously adjusted to the ground conditions and enable optimal use of the engine power. The positive effects of the rotary heads in reducing noise emissions are additionally supported by the use of **sound proofed Kelly bars**.

No additional lifting equipment is required when attaching the rotary head. The rotary head is locked on the guide carriage via hydraulic cylinders and the supply lines are connected via quick-release couplings. Some models are equipped with a **Docking-System**, which makes it much easier to attach and detach the rotary head on the construc-

tion site. There is no need to manually connect the hydraulic lines, which significantly reduces the risk of mistakes and accidents.

The DELMAG rotary heads are easy to maintain. Wear parts are easily accessible. For example, the **drive keys** can be **exchanged from the outside** without having to dismantle the rotary head.



# CARRIERS

Ever since 2008, ABI has also been building the carriers for selected models of the RH series. The decision to build the carrier for the drill rigs itself resulted from the demands from the market. As a result, the know-how gathered over the years about the construction of drill rigs could be continuously implemented in the construction of the carrier and equipment and at the same time ABI can react more flexibly to their customers' requests.

In particular through the new development, the whole machine, consisting of the leader mast, kinematics and base carrier

are viewed as one unit and the complete hydraulic and electrical systems specially designed for drilling operations.

Three models are currently in production: the T80D carrier for the RH 34 drill rig, the T100D for the RH 38 and the T110D carrier for the RH 44 drill rig.





# Transport

Transport dimensions and weight are important criteria for construction machinery. The smaller drill rigs up to model type RH 20 can be transported in the standard configuration complete with rotary head and Kelly bar. This attribute guarantees minimal set-up times so that the drill rig is ready for use in just a few working steps. Once on the construction site, only the drilling tool needs to be attached following transport and inspection.

In the larger models, the rotary head or the work attachment, Kelly bar and, if necessary, the counterweights are removed for

transport. Starting with the RH 38 model, the transport weight can also be reduced by removing the crawler track units. The RH 44, the largest model of the DELMAG drill rigs, has a separable two pieces boom extension so that the complete leader mast unit can be dismantled and transported separately.





# Engines

The EU Emission regulation for mobile machines (EU 2016/1628) regulates the engine limit values for construction machines in Europe. The engines installed in most of the ABI and DELMAG machines belong in the power category between 130 and 560 kW. Only a few models are offered with higher engine power.

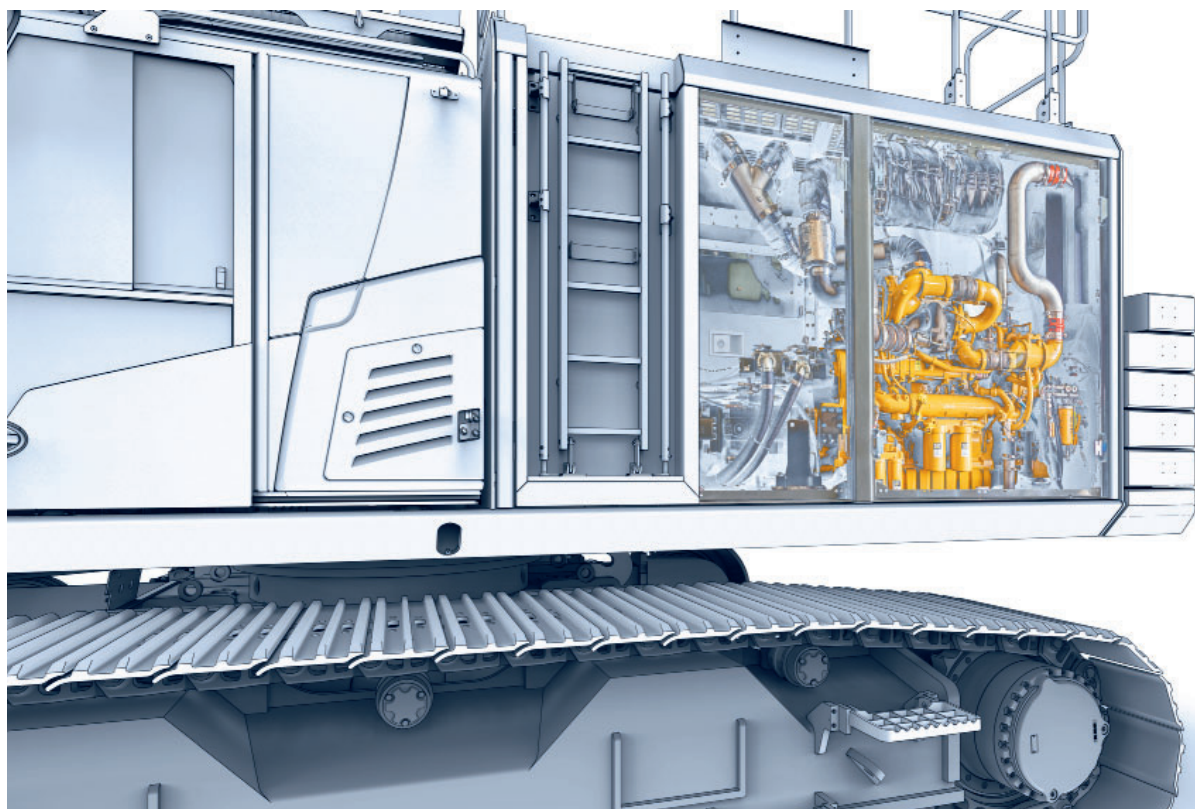
To achieve a compliance with the limit values a comprehensive exhaust after treatment system has to be installed. The essential components usually comprise of Diesel Particulate Filter (DPF), the Diesel Oxidation Catalytic converter (DOC), and Selective Catalytic Reduction (SCR) with urea injection.

The DPF filters a large part of the particulate matter from the exhaust gas flow. The DOC catalytic converter removes carbon monoxide (CO) and hydrocarbons (HC) from the exhaust gas by oxidation with the residual oxygen. In the SCR catalytic converter, the nitrogen oxides are reduced by a chemical reaction with injected urea and converted

into non-toxic nitrogen and water. In Europe, urea is known under the brand name AdBlue and in North America as DEF. In the power category above 560 kW, the limit values in the current regulations are higher and the machines can work without DPF and SCR.

The installed technology results in higher requirements for the operating companies for maintenance and operation as well as in the purchase of operating materials, which are generally available in the EU and the USA. The use of low-sulphur diesel, low-sulphur and low-ash engine oil and filling in the urea/AdBlue is essential for trouble-free operation of the machines.

The current ABI and DELMAG carriers comply with the latest emission regulations EU Stage V as well as US EPA Tier 4f and can therefore be used flexibly on construction sites within Europe and the USA.



# Drill Rigs at Work

**Kelly drilling is one of the most widely used drilling methods for the production of cased and uncased drilled piles due to the many possible uses and numerous variations.**

DELMAG drill rigs are also used for in-situ auger drilling and increasingly for soil improvement measures, such as soil mixing. The robust DELMAG drill rigs also enable down-the-hole hammers to be applied in rocky ground conditions.

Suitable models of the RH series can also be equipped with a VDW system. Using this method, the auger and casing are inserted in the one drilling process.



The biggest model of the DELMAG rotary drill rigs built on an ABI T110 carrier for the production of drilled piles with a diameter of 1800 mm and to a depth of 40 m using the Kelly drilling method.





The smallest model of the DELMAG rotary drill rigs while Kelly drilling. The machine can be transported with the rotary head and Kelly bar still attached.



Removing the complete leader mast unit via the separable two pieces boom extension in order to reduce the transport weight of the machine, the complete leader mast unit can be removed for transport within a remarkably short space of time.





The telescopic undercarriage is equipped with mechanical connections for a casing oscillator (with an integrated control unit) for assisting in inserting large diameter casings in difficult soil conditions.



Drill rig with Kelly bar guide: In the case of inclined piles, the Kelly bar is also guided at the upper end to prevent the Kelly bar from tipping.



Manufacture of drilled-in-situ concrete piles. The achievable depth can be extended using a concrete Kelly extension.



Uncased Kelly drilling with a short leader mast foot: The short leader mast foot enables larger diameters to be drilled, as the drilling tool can rotate underneath the leader mast.





Soil mixing (WSM) using an RHP 150 auger drive to increase the load-bearing capacity of the soil. The existing soil material is mixed with a suspension additive.



Drill rig in a short leader mast application with limited headroom: The required depth is achieved by installing additional pipe sections on the mixing rod.



DELMAG drill rig during VDW drilling: The pile is created in a single pass. Immediately after reaching depth the concreting takes place and continues during the extraction process.



DELMAG drill rig using a down the hole hammer in hard, rocky ground.



The DELMAG drill rigs can be equipped with further helpful options.



The **Docking-System** enables the rotary head to be connected quickly; the hydraulic supply is established via a coupling system after locking.



Large pile inclinations can be achieved using the DELMAG drill rigs. The **Kelly bar guide** at the upper end of the Kelly bar ensures safe guidance for inclined drilled piles.



When CFA drilling, the **auger cleaner** enables safe cleaning of the auger and thus prevents the spoil from falling down in an uncontrolled manner.



The **drilling tool guide** is used for CFA, VDW drilling, soil mixing as well as for maintaining the verticality when drilling.

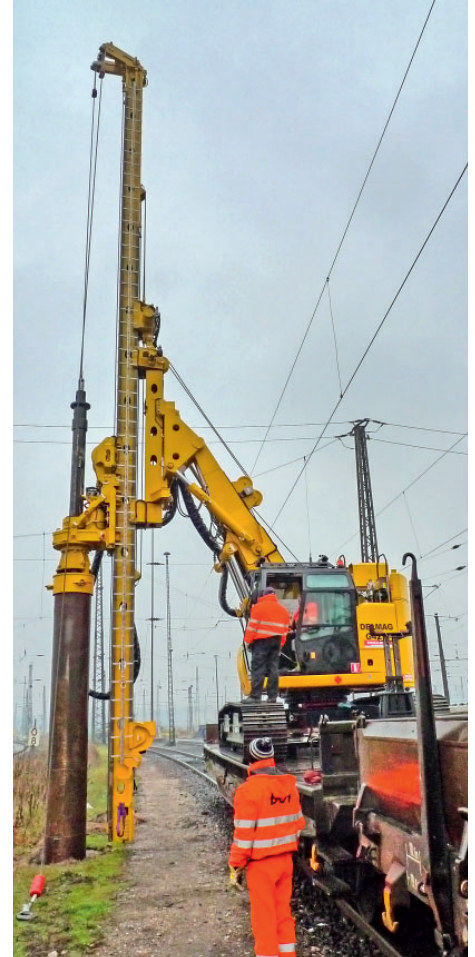


# Custom-designed Machines

In addition to DELMAG drill rigs for classic and alternative drilling methods, ABI also develops and manufactures customised machines for applications that are unique and

require a special machine or a specific configuration.

ABI is always prepared to take up these new challenges.



For the introduction of masts along the railroad tracks the fixed leader mast G 42 was developed. The G 42 is designed for operation using a DELMAG diesel pile hammer and can work directly from a flat rail car. Depending on the means of transport, rail car or low-loader, the leader mast can be placed either to the front or to the rear. In addition, the field of application of the pile driver has been expanded to include drilling. The G 42 B has a feed system and can be used for Kelly drilling.



Special civil engineering machines designed and produced in GERMANY - Spezialtiefbaumaschinen konstruiert und hergestellt in DEUTSCHLAND

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