GRUNDO DRILL
THE NEW GENERATION
FLUID-ASSISTED HDD RIGS & ROCK DRILLING HDD RIGS
THE NEW DIMENSION OF DRILLING

THE NEW GRUNDODRILL GENERATION
Horizontal Directional Drilling is a complex process, which places equally diverse demands on machine technology. The intensive examination of these requirements from the user’s point of view led to a unique development process in which we questioned every detail and rethought every component. The result is the new GRUNDODRILL generation with a ground-breaking concept, allowing for utmost flexibility and maximum productivity in steerable trenchless pipe installations. Thanks to the trend-setting combination of innovative technology and maximum digitisation, this is easier than you may think - or “simple & easy” as we say.

With the new GRUNDODRILL generation, TRACTO-TECHNIK offers a complete series with six models in the performance classes from 60 to 280 kN, with the integrated concept convincing in every respect.

■ FLEXIBLE MODULAR CONCEPT
The modular design for different machine sizes and a multitude of options allow the user to configure his drilling rig from this kit according to his individual requirements.

■ PRODUCTIVE PEAK PERFORMANCE
The significantly increased rotation power and drilling fluid capacity in combination with the corresponding high drive power leads to a considerable increase in productivity. This allows the drilling rig to be optimally adapted to any geology.

■ ROCK DRILLING IN ALL PERFORMANCE CLASSES
Due to the unique machine concept, the complete series can be used as a Jet Condition System (JCS) with normal rods in conventional soils or as an All Condition System (ACS) with twin-tube rods in complex geologies and rocks.

■ INTUITIVE OPERATING CONCEPT
The intuitive operating concept, with almost all functions of the drilling rig being controlled via a central touch screen, is consistently tailored to the needs of the operator. This allows ergonomic and fatigue-free working with an increased degree of automation.

■ REMOTE-CONTROLLED DRILLING
The extensive automation of all processes enables remote-controlled drilling with the help of a specially developed, innovative remote control.

■ DIGITAL SOLUTIONS
Intelligent software solutions that centrally link planning, execution, billing, documentation and service allow for individual control and increase of productivity.
REVOLUTIONARY IN ALL PERFORMANCE CLASSES

INNOVATION DOWN TO THE LAST DETAIL
The well thought-out construction of the new GRUNDOHRILL generation combines numerous innovative individual solutions into a future-oriented and unique overall concept. All models in the range have the same outstanding features that ensure maximum power for thrust, rotation and drilling fluid is always available.

An intelligent control concept makes sure that the overall power is optimally transferred onto the individual components as required. This makes the new GRUNDOHRILL generation the most efficient and productive drilling rig in its class on the market.

POWERFUL ROTARY DRIVE
- A variable torque adjustment considerably increases the productivity of the drilling rigs. Torque and rotational speed can be optimally adapted to the respective geology and drilling tools.
- Compared to conventional drilling rigs, the new concept leads to a considerably higher power output over the entire speed range.

MAXIMUM DRILLING FLUID OUTPUT
- Depending on the performance class, different pump options are available, each providing the maximum drilling fluid volume at maximum pressure at the same time.
- This particularly high drilling fluid performance guarantees fast drilling progress and maximum clearing capacity.

EFFECTIVE THRUST
- The Rack & Pinion drive with significantly increased idle stroke speeds ensures shorter cycle times in push mode and when exchanging the rods.
- The infinitely variable thrust and pulling force limitation and an anti-stall-valve guarantee safe, fatigue-free and material-friendly working.
A FLEXIBLE MODULAR SYSTEM
Due to the modular construction of the new GRUNDO DRILL generation, it is possible to configure each drilling rig individually. A selection of almost forty options allows the user to flexibly equip his drilling rig according to its application range and the desired comfort. That way, you only pay for the features you really need for your tasks.

The illustrations show examples of the options for different control stands and anchoring plates.

In addition, numerous other options are available, such as central lubrication, camera surveillance, high-pressure cleaners or mounting kits for cable-guided drilling. Our sales staff will be happy to advise you on the configuration of your individual drilling rig.

THE CHOICE IS YOURS

* Within the EU, drilling rigs with a total weight of ≥ 8 t must be equipped with a full cabin.
MOBILE COMMAND CENTRE

The unique and innovative operating concept of the new GRUNDODRILL generation is the result of a thorough, in-depth development process in close cooperation with drill masters and experts in ergonomics and biomechanics. By combining state-of-the-art control technology with intelligent software and a high degree of automation, the operator can concentrate more than ever on his most important activity: drilling.

OPERATION "SIMPLE & EASY"
- The entire operating concept is self-explanatory and intuitive - comparable to modern smartphones or tablets.
- The automation of all processes and work steps leads to an increase in productivity and to a relief of the operator.
- All central functions of the drilling rig can also be controlled manually as an alternative.

TOTAL OVERVIEW
- An integrated camera concept automatically provides the operator with an optimum overview of all relevant areas of the drilling rig at all times.

This modern and intuitive operating concept makes a central contribution to increasing productivity in the HDD and considerably facilitates the training of new drill masters.

COMFORT OPERATOR CABIN – THE PERFECT WORKPLACE

The design and equipment of the comfort operator’s cabin have been consistently adapted to the needs of the operator. In combination with the camera concept, large panoramic windows offer an optimum all-round view and eliminate the need to swivel the cabin during operation. This makes it possible to work even in the tightest of spaces. The significantly enlarged cabin, in combination with an optimised cabin suspension and an ergonomic and optionally air-suspended seat, becomes the perfect workplace.

FURTHER FEATURES:
- Central locking, electronic immobiliser, numerous shelves and charging sockets, bottle cooler, radio with Bluetooth hands-free kit
- Optional: air conditioning or automatic climate control
NEW PERSPECTIVES

REMOTE CONTROLLED DRILLING
The drilling rigs of the new GRUNDODRILL generation can be operated completely by remote control even in drilling mode. Due to the intelligent operating concept, all functions of the drilling rig can be conveniently controlled and monitored from outside the operator’s cabin using a specially designed remote control unit. This particularly hard-wearing device, which is suitable for construction sites, combines the same operating elements that are located in the cabin with an outdoor tablet, which is used as the central operating unit of the machine control system.

- All control elements of the cabin and the remote control are identical in function, form and arrangement. This allows the equipment operator to choose freely and to switch quickly and smoothly between the different operating modes.
- In combination with the new camera concept, full control of the entire drilling rig is always guaranteed, even when operating with the remote control.
- Reduced downtimes on the construction site due to increased flexibility. Short-term personnel bottlenecks – e.g. when mixing fresh drilling fluid – can be bridged by the equipment operator operating the drilling rig and the locating technology simultaneously.
- New perspectives for the operator – for example: Monitoring of the drilling fluid backflow or the pipe pulling process in the target pit, optical control when bypassing existing pipes and obstacles etc.

The GRUNDODRILL remote control unit increases safety and flexibility in daily use on the job site and the efficiency when drilling. As simple as possible.
PERFECT MATCH

INTEGRATED LOCATION SOLUTION
The integration of the DCI location display into the control concept of the new GRUNDODRILL generation is a unique feature that sets new standards in the HDD market. By merging drilling equipment and locating technology into a single unit, all relevant data is brought together centrally to further simplify the drilling process.

TREND-SETTING PARTNERSHIP
Reliable and precise locating technology is required for the safe and precise control of the drill head. As the manufacturer of the first detection systems to capture the inclination and roll of the drill head, Digital Control has been setting the standards in this field worldwide for decades. This continuous innovative strength makes DCI the perfect partner for developing the sophisticated location feature.

The result of the cooperation is as ingenious in its conception as it is easy to use. A hardware module developed by DCI (AIM – Aurora Interface Module) and an interface jointly developed by DCI and TRACTO-TECHNIK are fully compatible with all locating systems of the current DCI F series.

- One central screen for machine data and location information – even with remote drilling.
- Compatible with DCI locating systems F1, F2, F5 and Falcon F1, Falcon F2, Falcon F5.
- The integration of all DCI settings and the adaptation of the look & feel to the TRACTO-TECHNIK environment simplifies the introduction and training of new operators.
- Contributes decisively to the fast and more sustainable training of new specialists – drill masters and locating technicians can follow the drill head together.
FAST LOADERS WITH GROWTH POTENTIAL

The new GRUINDODRILL generation’s rod magazine combines a large magazine capacity with an innovative and flexible reloading concept. This clever solution guarantees very short cycle times when changing drill rods and minimum effort when reloading or removing drill rods for particularly long bores.

INTELLIGENT STOCK KEEPING
The magazine concept significantly increases flexibility and productivity when using the drilling rig.
- Operates space-saving, in very tight site conditions - the drilling rig is fully operational in the specified transport width.
- Optional reloading boxes make reloading additional drill rods a child’s play.

- A telescopic crane, also available as an option, ensures self-sufficient, ergonomic and safe handling of the reloading boxes.
- Different reloading options are available:
  - Individual drill rods can be fed manually from the side and are then loaded fully automatically into the drill rod box.
  - Automated working directly from the reloading box – the rods are removed directly from the reloading box and transported to the drilling axis.
  - Fully automatic loading or unloading of the rod box from the reloading box.
  - Automation allows all reloading options to be used without an operator in the cabin.

RELIABLE AND FAST THROUGH ALL GEOLOGIES
A new generation of drill rods, which is precisely matched to the GRUINDODRILL rigs, enables significantly lower bending radii with higher performance and maximum drilling fluid output even over long drilling distances.
- A newly designed polygon plug-in connection for the inner rods of the twin-tube rods ensures reliable torque transmission in the tightest of spaces. This ensures high drilling fluid output and productivity, even when using the twin-tube rods.
- One-piece forged drill rods with ELICON threads and bearing mounted inner rods ensure reliability and long service life.
SMART LINKING

360° DIGITAL SOLUTIONS
360° stands for integrated digital solutions, which allow you to master your complex tasks more easily and quickly due to intelligent linking. Our cloud-based software solutions for HDD technology centrally link planning, execution, billing, documentation and service. That way you can use the machine technology even more efficiently and profitably — conveniently via PC, smartphone or tablet.

Access via the modular platform is quick and easy, use intuitive. The first modules of this 360° experience are the Cockpit and QuickPlanner3D for HDD technology and a tailor-made eShop for ordering accessories and spare parts.

EVERYTHING IN VIEW WITH THE COCKPIT
With the Cockpit, all relevant performance and consumption data of your GRUNDODRILL rigs are centrally recorded and can be retrieved quickly at any time. Maximum data transparency allows you to individually control and increase the productivity of your drilling equipment.

- Efficient HDD fleet management
- Faster planning, monitoring and coordination of HDD construction sites
- Determination of saving potentials through data comparison
- Value retention of the HDD device due to optimised service

TARGET PLANNING WITH THE QUICKPLANNER3D
With the QuickPlanner3D, you plan the optimal bore path automatically and quickly. The intelligent software is a self-optimizing bore planner that calculates the shortest bore path while reliably taking constraint points and limiting parameters into account.

- Efficient planning and quick feasibility study of a drilling route
- Calculation of the optimal bore path using intelligent algorithms
- Realistic results due to unique three-dimensional calculation and planning

CLICK & BUY IN THE ESHOP
For easy and quick ordering of accessories and spare parts for our NODIG technology we have a tailor-made eShop. Intelligent linking makes the ordering process transparent and minimises the risk of incorrect orders. In the integrated branding shop you can order our popular merchandising items with the "mole label" at the same time. Just as fast and transparent.

www.TRACTO-TECHNIK.com/Services/360-Digital-Solutions/
FULL PERFORMANCE

ECONOMICAL RIGHT FROM THE FIRST METRE
Like all GRUNDODRILL systems, the new generation is characterised by outstanding quality, long service life and a wide range of applications. Thanks to the flexible concept, the new series works even more productively with any type of application.

PILOT BORE* IMPLEMENTATION OF THE PLANNED DRILLING PROCESS
Linear bores: Pushing and rotation of the bore head. Curved bores: Pushing of the aligned drill head (supported by paddle mode if required).

UPSIZING & PIPE PULLING* INSTALLATION OF THE PRODUCT/PROTECTION PIPE
Reverse pulling of the backreamer with pipe attached, intermediate upsizing may be necessary.

UNDERCROSINGS
The standard applications with the GRUNDODRILL include directional drilling operations beneath roads, railway tracks and buildings.

LONGITUDINAL BORES
Not only undercrossings, but also linear drilling operations taking a parallel course to roads, water bodies and buildings are common applications.

ROCK DRILLING
Bores in difficult geological conditions, especially in hard solid rock, can be carried out with the JCS series using a mud motor. For the ACS series with twin-tube rods, bores through rock are standard.

* Depending on soil class and required upsizing diameter special drilling tools are used.
**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Metrical</th>
<th>Imperial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrust and pullback force</td>
<td>130 kN</td>
<td>29,225 lbf</td>
</tr>
<tr>
<td>Max. feed rate (without load)</td>
<td>70 m/min</td>
<td>230 ft/min</td>
</tr>
<tr>
<td>Max. torque EL D67</td>
<td>4,500 Nm</td>
<td>3,320 lbf ft</td>
</tr>
<tr>
<td>Max. spindle speed EL D67</td>
<td>185 U/min</td>
<td>185 rpm</td>
</tr>
<tr>
<td>HP bentonite pump P62</td>
<td>190 l/min</td>
<td>50 gpm</td>
</tr>
<tr>
<td>Bentonite pressure P62 85</td>
<td>85 bar</td>
<td>1,233 psi</td>
</tr>
<tr>
<td>HP bentonite pump P72</td>
<td>320 l/min</td>
<td>85 gpm</td>
</tr>
<tr>
<td>Bentonite pressure P72</td>
<td>70 bar</td>
<td>1,015 psi</td>
</tr>
<tr>
<td>Rod magazine contents EL D67</td>
<td>168 m</td>
<td>551 ft</td>
</tr>
<tr>
<td>Number of rods</td>
<td>56 pcs</td>
<td>56 pcs</td>
</tr>
<tr>
<td>Effective rod length</td>
<td>3.000 mm</td>
<td>118 in</td>
</tr>
<tr>
<td>Min. bore radius EL D67</td>
<td>32 m</td>
<td>105 ft</td>
</tr>
<tr>
<td>Length x Width x Height (transport position)</td>
<td>7.040 x 1.850 x 2.660 mm</td>
<td>277 x 72.8 x 104.7 in</td>
</tr>
<tr>
<td>Length x Width x Height (working position)</td>
<td>8.080 x 1.850 x 3.185 mm</td>
<td>318.1 x 72.8 x 125.4 in</td>
</tr>
<tr>
<td>Max. weight*</td>
<td>tbd kg</td>
<td>tbd lbs</td>
</tr>
</tbody>
</table>

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**FEATURES**

- **JCS – JET CONDITION SYSTEM** – for drilling in loose rock
- Cummins engine Tier 5, 100 kW
- Variable torque and speed adjustment for maximum rotational performance and maximum productivity at any speed
- Fully automatic drilling operation incl. drill rod exchange and all other secondary activities
- Comfort operator’s cabin* incl. Grammer comfort seat (with air suspension*), central locking, electronic immobiliser, heating, air conditioning* or automatic climate control*, radio, hands-free equipment, bottle cooler
- Powerful bentonite HD pumps on board – full flow at maximum pressure for highest productivity
- Innovative and intuitive operating concept, radio remote control for remote-controlled drilling*
- Compatible with all digital solutions by TRACTO-TECHNIK
- Numerous other options available

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* depending on soil | * Option | depending on configuration | Data subject to change
**GRUNDODRILL ACS130**

**FEATURES**
- **ACS – ALL CONDITION SYSTEM** – for drilling in all geologies incl. solid rock/rock
- Cummins engine Tier 5, 115 kW
- Can optionally be used with EL-D80 twin-tube rods or EL D67 JET rods
- Variable torque and speed adjustment for maximum rotational performance and maximum productivity at any speed
- Fully automatic drilling operation incl. drill rod exchange and all other secondary activities
- Comfort operator’s cabin incl. Grammer comfort seat (with air suspension), central locking, electronic immobiliser, heating, air conditioning or automatic climate control, radio, hands-free equipment, bottle cooler
- Powerful bentonite HD pumps on board – full flow at maximum pressure for highest productivity
- Innovative and intuitive operating concept, radio remote control for remote-controlled drilling
- Compatible with all digital solutions by TRACTO-TECHNIK
- Numerous other options available

**TECHNICAL DATA**

<table>
<thead>
<tr>
<th>Drill Rod Type EL D80 / EL D67</th>
<th>metrical</th>
<th>imperial</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrust and pullback force</td>
<td>130 kN</td>
<td>29,225 lbf</td>
</tr>
<tr>
<td>Max. feed rate (without load)</td>
<td>70 m/min</td>
<td>230 ft/min</td>
</tr>
<tr>
<td>Max. torque EL D80 / EL D67</td>
<td>4.500 Nm</td>
<td>3,320 lbf ft</td>
</tr>
<tr>
<td>Max. torque EL D80 (inner rod)</td>
<td>1.200 Nm</td>
<td>885 lbf ft</td>
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<td>Max. spindle speed EL D80 / EL D67</td>
<td>230 U/min</td>
<td>230 rpm</td>
</tr>
<tr>
<td>Max. spindle speed EL D80 (inner rod)</td>
<td>400 U/min</td>
<td>400 rpm</td>
</tr>
<tr>
<td>HP bentonite pump P62</td>
<td>190 l/min</td>
<td>50 gpm</td>
</tr>
<tr>
<td>Bentonite pressure P62 85</td>
<td>85 bar</td>
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<tr>
<td>Bentonite pressure P72 85</td>
<td>70 bar</td>
<td>1,015 psi</td>
</tr>
<tr>
<td>Rod magazine contents EL D80 / EL D67</td>
<td>120/168 m</td>
<td>394/551 ft</td>
</tr>
<tr>
<td>Number of rods</td>
<td>40/56 cs</td>
<td>40/56 pcs</td>
</tr>
<tr>
<td>Effective rod length</td>
<td>3.000 mm</td>
<td>118 in</td>
</tr>
<tr>
<td>Pilot bore Ø EL D80 / EL D67</td>
<td>140/100 mm</td>
<td>5.54 in</td>
</tr>
<tr>
<td>Min. bore radius EL D80 / EL D67</td>
<td>35/32 m</td>
<td>115/105 ft</td>
</tr>
<tr>
<td>Length x Width x Height (transport position)*</td>
<td>7.490 x 1.850 x 2.660 mm</td>
<td>295 x 72.8 x 104.7 in</td>
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<tr>
<td>Length x Width x Height (working position)*</td>
<td>8.450 x 1.850 x 3.185 mm</td>
<td>332.7 x 72.8 x 125.4 in</td>
</tr>
<tr>
<td>Max. weight*</td>
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<td>Engine manufacturer</td>
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<td>Cummins</td>
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<td>F3.8</td>
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<tr>
<td>Emissions standard</td>
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<td>Stage V</td>
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<tr>
<td>Max. engine output</td>
<td>115 kW</td>
<td>156 hp</td>
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<tr>
<td>Diesel tank capacity</td>
<td>134 l</td>
<td>35 gal</td>
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<tr>
<td>AdBlue tank capacity</td>
<td>18.9 l</td>
<td>5 gal</td>
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<tr>
<td>Fresh water tank capacity</td>
<td>120 l</td>
<td>32 gal</td>
</tr>
<tr>
<td>Inclination angle</td>
<td>0–30 °</td>
<td>0–30 °</td>
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<tr>
<td>Jet mode: Upsizing Ø outer pipe Ø s</td>
<td>500/400 mm</td>
<td>20/16 in</td>
</tr>
<tr>
<td>Jet mode: Bore length s</td>
<td>300 m</td>
<td>984 ft</td>
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<tr>
<td>Rock mode: Upsizing Ø outer pipe Ø s</td>
<td>355/250 mm</td>
<td>14/10 in</td>
</tr>
<tr>
<td>Rock mode: Bore length s</td>
<td>200 m</td>
<td>656 ft</td>
</tr>
</tbody>
</table>

* depending on soil ** depending on configuration | Data subject to change
WELL EQUIPPED IS HALF WAY THERE

ACCESSORIES
Drilling tools, perfectly adapted to the drilling rig, guarantee optimal drilling progress through every type of soil. Robustness and durability of all parts are guaranteed.

STANDARD EQUIPMENT
- Transmitter housing with bore head
- Medium Soil Reamer
- Cone Reamer
- GRUNDOREAM

ROCK DRILLING EQUIPMENT
- ELICON 95 rock drilling unit with roller chisel
- Hard Soil Reamer
- Hard Soil Rockreamer
- Holeopener

FULL SUPPLY

MIXING UNITS
A first-class drilling fluid technique is an important component for successful drilling. In combination with the drilling rig and drilling tools, the TRACTO-TECHNIK drilling fluid technology provides a coherent package for efficient work – even in complex soils. Powerful mixing systems and pumps guarantee high drilling fluid volumes. Professional measuring units and drilling fluid additives are available to ensure a drilling fluid quality that is well adapted to the soil.

TRANSPORT
Learn more about this topic in our in-house training courses or ask us for additional information on mixing systems and truck platforms.
SERVICES ALL AROUND TRENCHLESS TECHNOLOGY
INTELLIGENT SOLUTIONS WITH ADDED VALUE

Before or after any purchase either in person or online - we are always at hand with help and advice for you. We can offer you comprehensive services and consultation that are specially tailored to the requirements in trenchless pipeline construction. Our services are as diverse as our range of products so you can concentrate fully on your business.

www.TRACTO-TECHNIK.com/Services

DIGITAL SOLUTIONS
On our website, you will find important information about our company, our products and their use in digital form. You can view the contents that interest you quickly and easily via the user-friendly, clearly structured navigation. Links to our social media channels can also be found there. For ordering accessories and spare parts for our NODIG technology products there is our eShop. You can order merchandising items with the “mole label” there as well.

Our cloud-based solutions for the HDD drilling technology combine planning, execution, billing, documentation and service in one location. With the Cockpit you always have the very latest key machine data to review at any time of the day. With the QuickPlanner3D function, you can plan the shortest and safest bore path in next to no time. Our digital solutions make trenchless technology even more efficient and profitable, simply via PC, smartphone or tablet.

FINANCING & WARRANTY
We offer attractive financing solutions for new and used machines to our customers and sales partners through TRACTO-TECHNIK Finance GmbH. Be it financing, hire purchase, various types of leasing or insurance: we provide extensive expert advice in order to find the tailored solution for you. Discretion goes without saying.

USED EQUIPMENT
Your used equipment is in good hands with us. Be it our own or third-party products, be it with new purchase or not - you can rely completely on our full service. We assess the equipment on-site, advise you on purchase or trade-in and carry out the professional repair. With the “Certified Used Equipment” seal of approval, we achieve the best price for you via our use machine website with access to one of the world’s largest construction machinery platforms.

AFTER SALES
Via our worldwide service network, even after your valued purchase we will be there to assist you. Alongside our headquarters in Lennestadt, we have a total of six other TRACTO-TECHNIK customer centres in Germany as well as our worldwide sister companies and sales partners guarantee of fast supply of spare parts and immediate availability. Our competent service staff offer fast assistance to make sure that you do not lose any valuable in case of emergency - wherever you may be.

TRAININGS
Qualified training in theory and practice are a central concern for us to enable users and partners to achieve the greatest possible success with our products. The broad course range does not only address users, machine operators and service technicians, but equally specialists and managers, planners and contractors who would like to learn more about the versatile applications of the various NODIG systems. Our tailor-made training are held at our company locations or individually at your premises by certified trainers. Content, upcoming dates and registration details are on our website.

GEOSERVICE
In Germany, our Geoservice provides far-reaching geological expertise to support your projects. We offer advice on planning and drilling, for example in the courses of planned bore paths or by submitting queries about building ground. Furthermore, we can write geological assessments, review construction documents to determine the potential for supplements and draw up corresponding statements.