HORIZONTAL DIRECTIONAL DRILLING

POWERFUL TECHNOLOGY FOR TRENCHLESS UTILITY INSTALLATION

PIONEERING
UNDERGROUND
TECHNOLOGIES

HERRENKNECHT
Tunnelling Systems

Herrenknecht HDD Rigs
Proven and reliable

With horizontal directional drilling technology from Herrenknecht, underground utilities can be installed rapidly, economically and with minimized impact on environment and existing infrastructure. Later application of the utilities includes pipelines for oil and gas, hydrogen, water and sewage, district heating, high-voltage power lines, cable bundles and more. In terms of borehole diameter and length, HDD Rigs are very flexible and are mainly used for crossings and landfalls in relatively stable soils and rock.

On the jobsite:
HK250T Trailer Rig in operation, for cable landfalls on the coast of Brittany, France

PRODUCT HIGHLIGHTS

Complete portfolio from rigs to high pressure mud pumps, separation and mixing plants, Pipe Thruster, tooling and training programs.

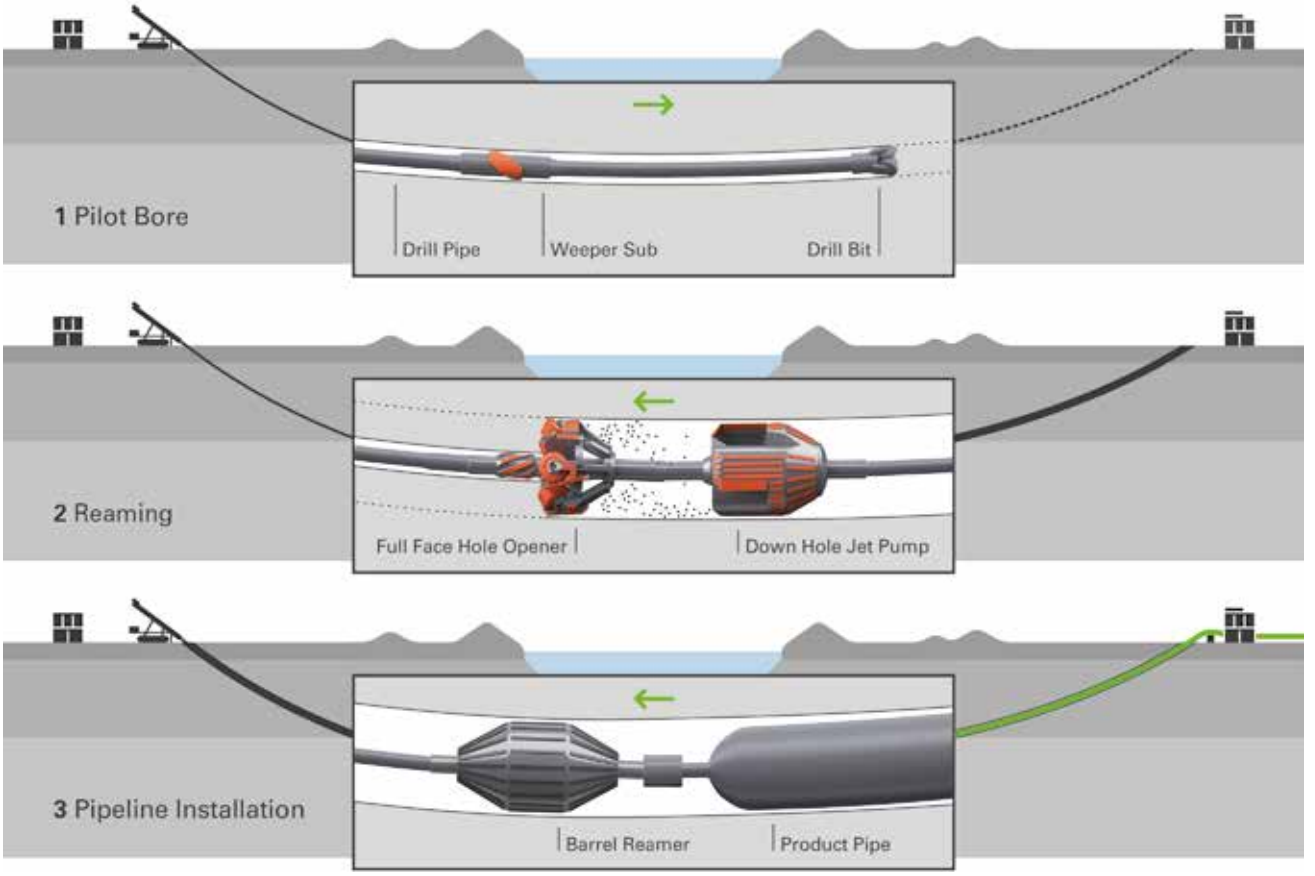
Broad geological range of application: relatively stable soils and rock.

Five basic rig types for different ranges of implementation available.

Economical and environmentally friendly method for installing underground utilities.

Economical method to install pipes and cables

With HDD (Horizontal Directional Drilling), underground utilities are installed in three steps. The depth and alignment of the pre-defined path for the bore is chosen by considering all different layers of soil and potential obstacles like boulders, foundations and more. The only on-surface equipment is located at the launch and reception point.



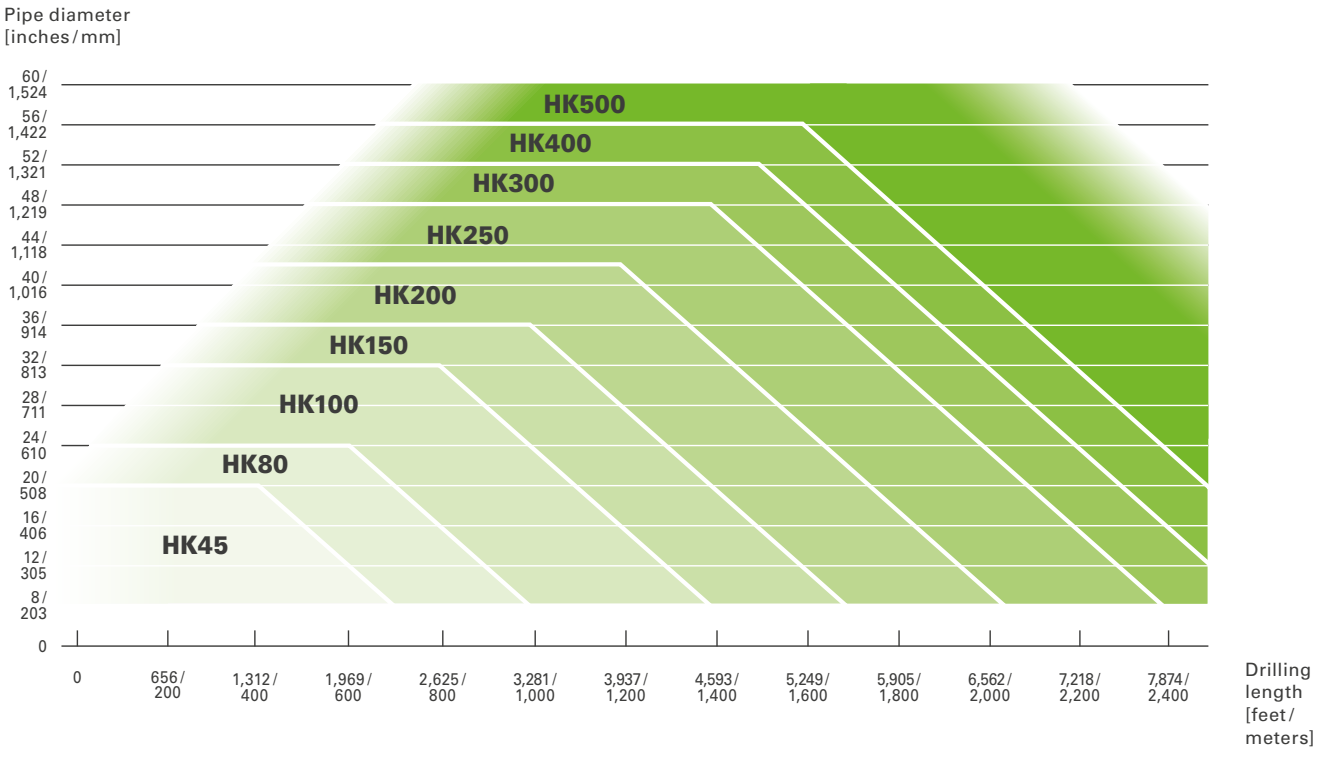
The HDD Rig drills a pilot bore from the launch point toward the reception point. The drill rods are guided by a surveying system located directly behind the drill bit. During drilling, mud pumps supply a bentonite suspension directly through the drill rods to the jets in the drill bit. The bentonite is mixed with the excavated material and flows back through the annulus to the starting point.

The pilot bore is followed by a second step: the reaming process. After exiting at the reception point, the pilot drill bit is replaced by a reamer. The borehole is enlarged when the drill rods are pulled back with the reamer toward the launch point. The water-bentonite mixture in the borehole supports the expanded borehole. Reaming is usually performed in several passes until the final borehole diameter is achieved – which is about 20–50 % larger than the actual pipe or cable diameter. The Herrenknecht Full Face Hole Opener shown enables reaming in one step from the pilot to a final diameter.

In a third stage, the prefabricated product pipe is connected to the drill rods. A reamer ensures a clean borehole and a swivel compensates the rotation of the drill string. The steel pipeline or cable protective pipe is then pulled back to the entry point by the HDD Rig until it reaches its final position.

Typical working ranges of Herrenknecht HDD Rigs

TYPICAL RIG WORKING RANGES



The right rig for the job

HDD Rigs developed by Herrenknecht can be delivered in five different configurations. All models have a control cabin, as well as their own power pack driven by a diesel or electrical engine in a sound-insulated container or onboard. Combinations of these Rig types are possible and one of Herrenknechts' strengths in engineering. Special configurations of Trailer/Modular Rigs or Compact/Crawler Rigs, e.g. merged with an electrical power unit, are frequently built and proven in numerous projects worldwide.

Frame Rig (F-Type): The low weight of Frame Rigs ensures easy transport, reaching the destination on a regular flatbed trailer. Loading or unloading and aligning of the rig on the jobsite requires a standard crane. All these factors make this unit a reliable and economical solution.

Trailer Rig (T-Type): Flexibility is the great advantage of Trailer Rigs. The low-weight Trailer Rig can be pulled by a standard semi-trailer truck. Setup, positioning, demobilization are all done without a crane. Projects with long distances to the jobsite or between crossings can benefit from this type of rig.

Technical data of Herrenknecht HDD Rigs

Herrenknecht HDD Rigs are defined by their pulling forces, which are between 45 and 500 tonnes (100,000 and 1,125,000 lbs). Depending on the application, the attached power packs have an output ranging from 278 to more than 1,000 kilowatts (from 370 to more than 1,340 hp) and are engineered to the customer's requirements.

Model	Pullback t	Pullback lbs	Torque kNm	Torque ft–lbs	Spindle Speed rpm	Drill Pipe m	Drill Pipe ft	Weight* kg	Weight* lbs
HK45	45	100,000	24	17,700	150	6 (R1)	20 (R1)	24,000	53,000
HK80	80	180,000	60	44,250	80	6 (R1)	20 (R1)	32,000	70,600
HK100	100	220,000	60	44,250	80	6 (R1)	20 (R1)	32,000	70,600
HK150	150	330,000	70	51,600	80	9.6 (R2)	31.5 (R2)	33,500	73,900
HK200	200	440,000	90	66,400	69	9.6 (R2)	31.5 (R2)	28,000	61,800
HK250	250	550,000	90/120	66,400/88,500	60/69	9.6 (R2)	31.5 (R2)	30,000	66,200
HK300	300	660,000	90/120	66,400/88,500	60/69	9.6 (R2)	31.5 (R2)	30,000	66,200
HK400	400	880,000	140/180	103,300/132,800	60	9.6 (R2)	31.5 (R2)	44,000	97,100
HK500	500	1,100,000	140/180	103,300/132,800	60	9.6 (R2)	31.5 (R2)	45,000	99,300

*Depending on rig design

All-electric HDD Rig Electro-hydraulic HDD Rig Diesel-hydraulic HDD-Rig

Crawler Rig (C-Type): The Crawler Rig can be fully autonomously unloaded from the trailer and positioned on site thanks to the fitted crawler system. On rough "off-road" terrain not accessible to trucks or cranes, Crawler Rigs enable mobility and maneuverability.

Modular Rig (M-Type): Modular Rigs can be disassembled into two or three modules for easy transport of the rig. Quick reassembly on the jobsite is ensured by special bolted connections.

Compact Rig (CK-Type): Short and compact designed rig optimized for smaller projects or inner city applications. Using range 1 (6 m/20 ft) drill pipes and optionally equipped with onboard control cabin and high pressure mud pump, the rig serves multiple customer needs.

Rig drive options overview

With the rising ecological requirements within the drilling industry, Herrenknecht has expanded its rig portfolio. Whether the jobsite is located in a remote place with poor infrastructure, in environmentally sensitive areas or in densely built-up inner-city surroundings, Herrenknecht can offer the appropriate drive solution.

- **ALL-ELECTRIC HDD RIG**
  By eliminating as many hydraulic functions as possible, the all-electric drive is the most silent and efficient system on the market. It impresses with low maintenance and high control precision.

- **ELECTRO-HYDRAULIC HDD RIG** | Hybrid
  The most cost-efficient and low-emission solution, field approved and more silent than diesel driven systems, with low maintenance, for flexible use worldwide.

- **DIESEL-HYDRAULIC HDD RIG**
  The diesel-hydraulic system is suitable for independent drilling operations. No larger generator systems are required to power the rig.

Herrenknecht
HDD full range equipment

SEPARATION AND MIXING

› Separation units from 100 to 500 m³ capacity
› Fine stage system additionally available
› Centrifuges
› Mud mixing units
› Transfer tanks
› Mud pit pumps

PIPE THRUSTER

› Pushing forces up to 750 t
› Diameters up to 60″
› Field proven and reliable design
› Completely independent of HDD Rig with its own power pack and control cabin

HIGH-PRESSURE MUD PUMP

› Triplex high pressure pumps in 20 ft Container
› Diesel or electric driven power unit available
› Adjustable capacity from 0 to 100 %
› Capacity up to 3,500 l/min possible
› Soundproof container for drive unit
› Easy access to pump

TOOLS

› Full Face Hole Openers from 30 to 72″ available
› Reaming from pilot to final diameter in one step
› Different interchangeable cutters to suit ground conditions
› Down Hole Jet Pump ensures a 98 % clean borehole
› Weeper Subs greatly reduce frack-out risks

BREAKOUT UNIT

› Mobile breakout unit for safe handling of drill pipe connections on pipe site
› Moved by crane or on adjustable support frame
› Driven independently by small diesel and electric power pack
› Available as complete exit side unit with spinner
› Optional crane available

TRAINING AND SUPPORT

› Individual training packages available
› Content and length adjusted to customer needs
› Support of all equipment worldwide
› Highly trained experts guarantee fast and professional support on site

More about
HDD technology:

Herrenknecht

A world leader in groundbreaking tunnelling technology

Herrenknecht is a professionally positioned and internationally oriented family enterprise. Herrenknecht delivers cutting-edge tunnel boring machines for all ground conditions and in all diameters – ranging from 0.10 to 19 meters. Under the umbrella of the Herrenknecht Group, a team of innovative specialists has formed to provide integrated solutions around mechanized tunnel construction with project-specific additional equipment and services.
Pioneering technology by Herrenknecht is always involved when paving the way for the future underground – whether for tunnelling, mining or exploration. Herrenknecht ensures safe and fast progress when constructing modern infrastructures in all areas of application. Exactly where they are needed.

Headquarters in Germany, active worldwide. With more than 6,200 project references, we are a technology leader all around the globe.

HERRENKNECHT
Tunnelling Systems

HERRENKNECHT AG
77963 Schwanau
Germany
Phone +49 7824 302-0
pr@herrenknecht.com
www.herrenknecht.com

10.2024 I HK3899