TRACTO

TRENCHLESS AND INNOVATIVE.
WE SUPPLY THE TECHNOLOGY
OF TOMORROW.

Discover now:
NODIG product variety for the pipeline construction of the future

ADVANCED TRENCHLESS TECHNOLOGY

WHY DIG TRENCHES WHEN THERE ARE BETTER SOLUTIONS?

TRACTO.COM

THE WORLD IS CHANGING.

Our cities are growing faster than ever. New technologies and energy concepts require new networks. We need the expansion and improvement of infrastructures. At the same time, it is more important than ever to comprehensively and consistently consider possible environmental influences in growth and renewal.

MISSION

It is our mission to significantly reduce the negative impacts and implications, which arise when expanding the required infrastructures. That is why we develop and produce the world's best trenchless technology equipment. That is why we promote and inspire this future technology wherever we can. That is why we are committed to its expansion at all levels.

ADVANCED TRENCHLESS TECHNOLOGY

TRENCHLESS TECHNOLOGY

With TRACTO's trenchless technology, pipelines are renewed and installed without tearing up valuable surfaces. This not only saves costs, but also time and resources. Whether network expansion, house connection or pipe renewal in the areas of water, gas, electricity, e-mobility, district heating or fibre optics - it can all be done without trenches.

TOMORROW'S TECHNOLOGY

Effective infrastructure. Renewable energy. We deliver the technology of tomorrow for the pipeline construction of the future. So you can focus on your business.

OUR PRODUCT VARIETY FOR YOUR NODIG PROJECTS

WATER
GLASS FIBRE
GAS
POWER
WASTE WATER
E-MOBILITY
WIND FARMS
PIPELINES
DISTRICT HEATING
SPECIAL SOLUTIONS

NODIG-Applications at

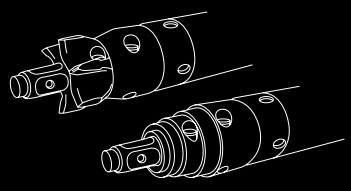
TRACTO.COM/
APPLICATIONS

NON-STEERABLE

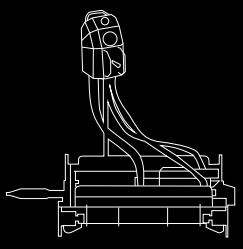
GRUNDORAM|GRUNDOCRACK

GRUNDOMAT

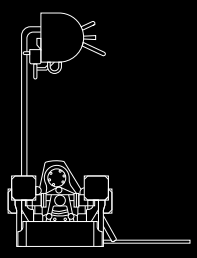
GRUNDOBURST



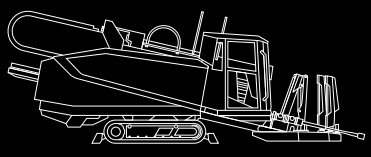
GRUNDOMAT
Soil displacement hammers
Bore diameter >180 mm



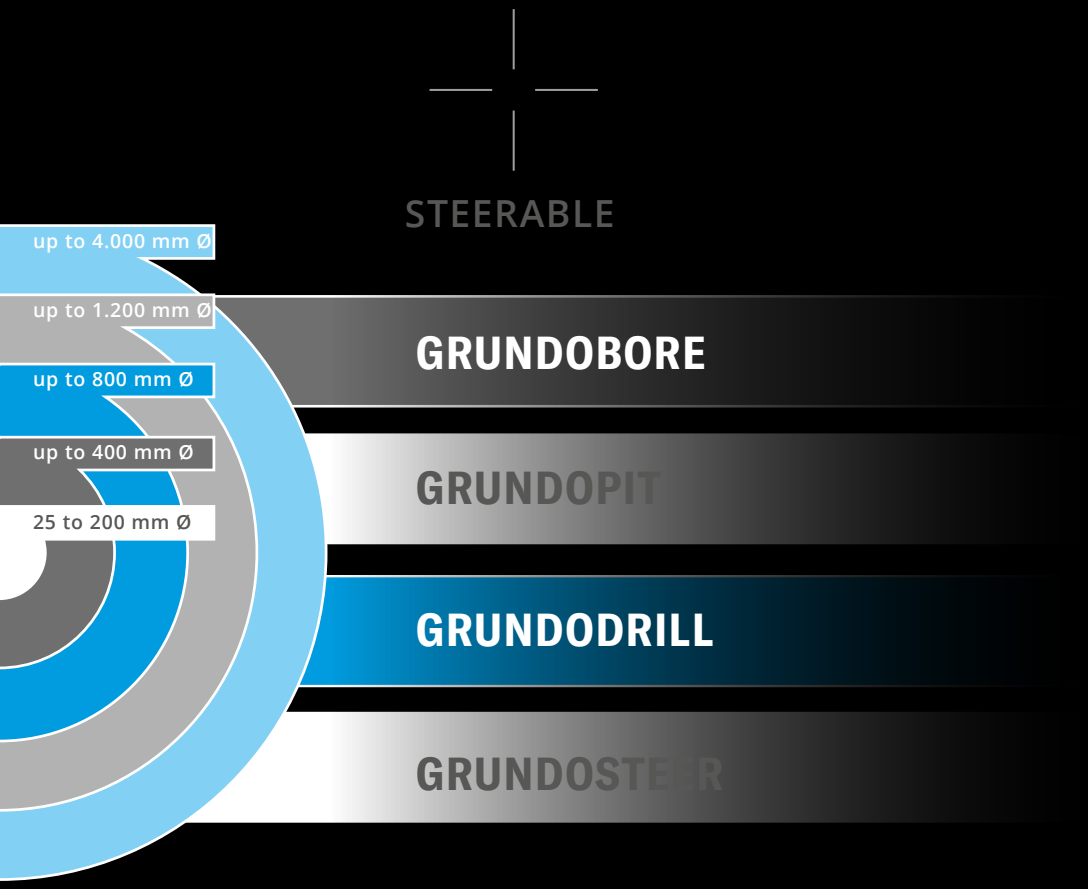
GRUNDOSTEER
Guided rod pusher
Bore diameter >100 mm

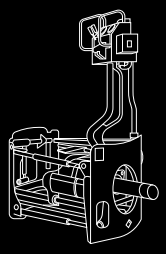


GRUNDOPIT
Mini fluid-assisted HDD rigs
Bore diameter > 200 mm Ø

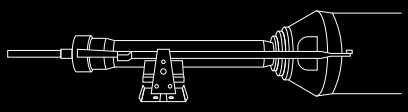


GRUNDODRILL
Fluid-assisted HDD rigs
Bore diameter > 710 mm Ø

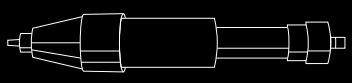




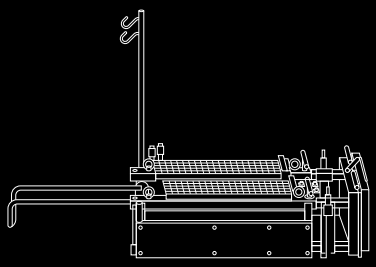
GRUNDOBORE
Auger boring unit
Bore diameter > 280 mm Ø



GRUNDORAM
Horizontal rammers
Bore diameter > 900 mm

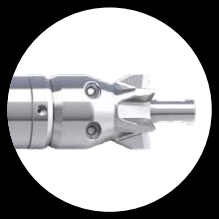


GRUNDOCRACK
Dynamic pipe bursting systems
Bore diameter >380 mm

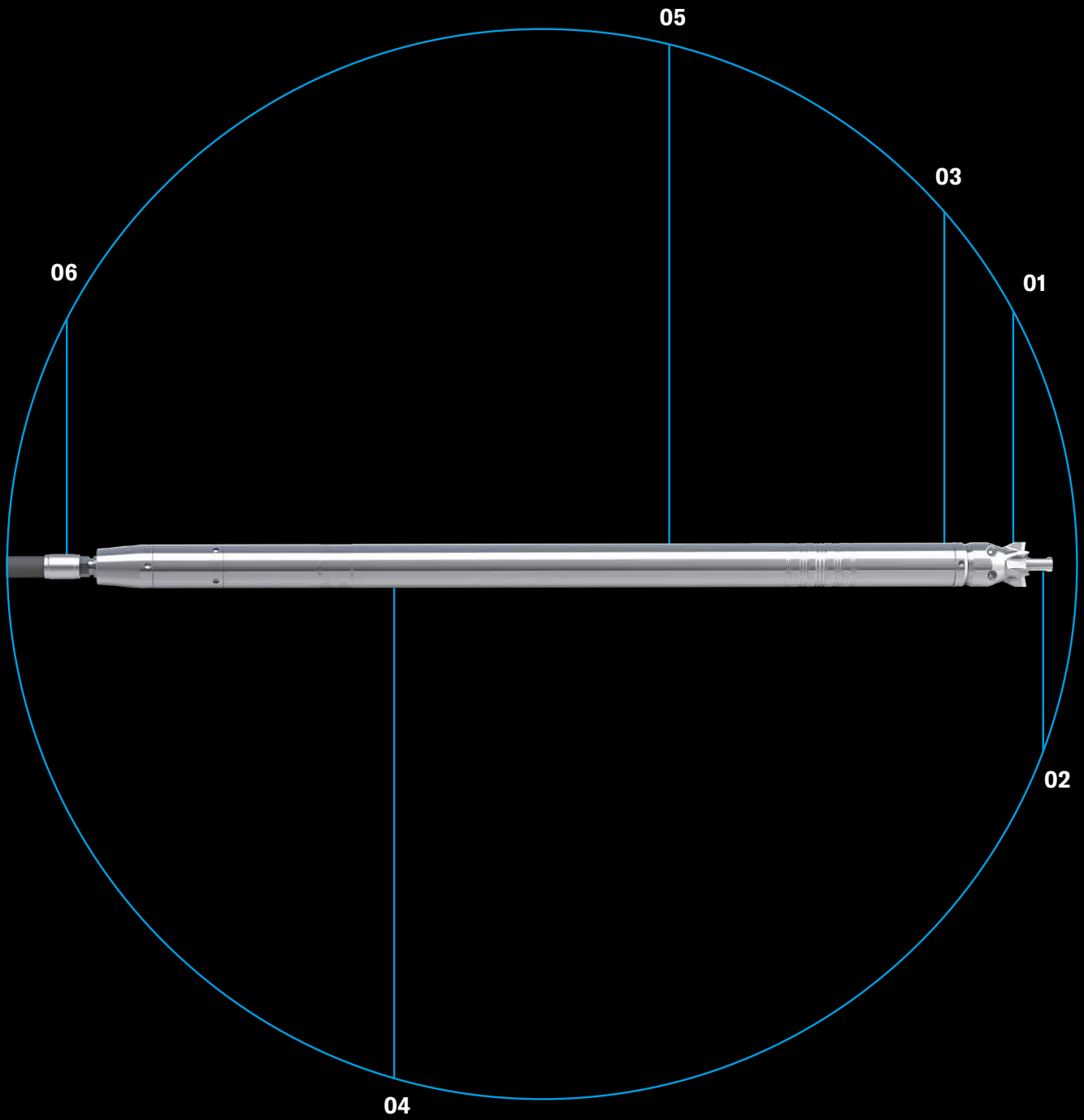


GRUNDOBURST
Static pipe bursting systems
Bore diameter > 1,200 mm

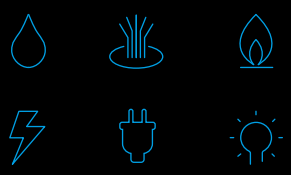
GRUNDOMAT SOIL DISPLACEMENT HAMMERS UNBEATABLE: THE ORIGINAL



All GRUNDOMAT also available with step head



APPLICATIONS

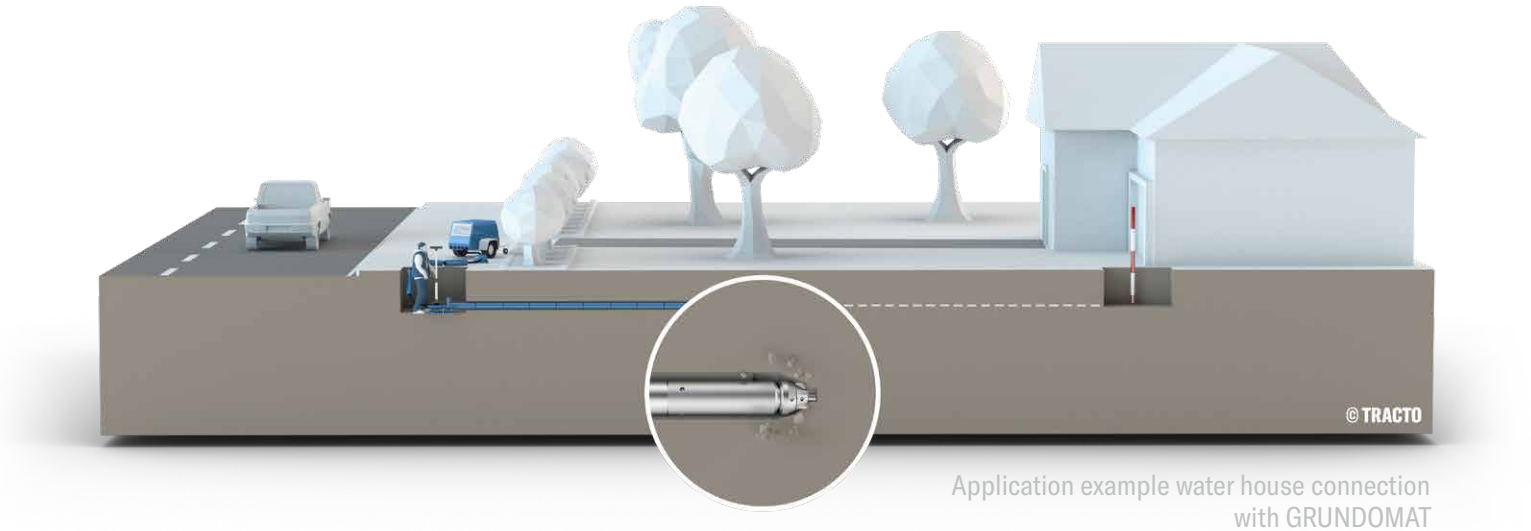


01 Crowned and stepped head with 2-stroke method
02 Concentration of impact energy in the bore direction
03 No front machine lock
04 Low-wear and low-maintenance casing
05 Easy to read wear indicator
06 Various attachment options for various applications

GRUNDOMAT SOIL DISPLACEMENT HAMMERS - For more than five decades, the pneumatically driven GRUNDOMAT 'moles' have been synonymous with accurate underground pipe-installations and representative of the trenchless 'mole technology'.

When driving the GRUNDOMAT forward, the soil is displaced into the surrounding soil and compacted. This creates a line channel into which short pipes with smooth sockets, which do not protrude on the outside, long pipes up to OD 180 made of plastic, or cables are pulled in immediately or subsequently over lengths up to 25 m. In addition, the soil displacement hammers can be applied horizontally and vertically for further applications.

The 2-stroke principle guarantees the GRUNDOMAT's aiming accuracy. The internal piston first hits the chisel head, which in the first stroke drives forward to create the line channel and destroys any obstacles along the way. The casing is only impacted in the second stroke and pulled along with the pipe attached. As a result, point resistance and casing friction are overcome more easily, making the GRUNDOMAT work with outstanding precision even in stony soils.



Application example water house connection with GRUNDOMAT

FACTS

INSTALLATION METHOD

GUIDED

UNGUIDED

PIPE DIAMETER

45 – 180 MM Ø

MAIN APPLICATIONS

- **HOUSE CONNECTIONS**
- **UNDER-CROSSINGS**

SPECIAL APPLICATIONS

- **DYNAMIC PIPE RENEWALS** (from type 95)
- **PIPE RAMMING** (from type 130)
- **DRIVING OUT STEEL TUBES**
- **PILE FOUNDATIONS**

IN FIVE SENTENCES

1

Strikingly precise

Hardly anything can knock GRUNDOMAT off course. The 2-stroke method with movable head ensures maximum penetrating power and dead-on-target thrust. The soil displacement hammer can be used in almost all displaceable soils - with the crowned head even in very stony and densely bedded soils.

2

Enormously durable

A sophisticated sliding and sealing technology ensures extraordinary durability and everlasting maximum performance of the GRUNDOMAT. At the same time, the service expenditure is minimal. The soil displacement hammer has been designed to protect the force transmission areas from any damages,

3

Extremely versatile

Thanks to attachment options such as reverse cone, pull sleeve or PE pipe connection, the GRUNDOMAT can be applied in all soil conditions - e.g. horizontally for immediate pipe installation, subsequent pipe pulling and steel pipe extraction or vertically for pile foundations.

4

Totally reliable

The premium quality of all components - such as an internally and externally chromed casing or specially hardened, corrosion-protected pistons, chisels and heads - makes the GRUNDOMAT a model of reliability and guaranteeing maximum safety during operation.

5

Super ergonomic

The operation of the GRUNDOMAT is extremely comfortable and can be adapted to individual needs. For example, gear shifting: whether by simply turning the hose with the push control or simply flipping a lever with the servo control - the operator remains in control.

PERFORMANCE DATA

TYPE		45	55	65	75	85	95	110	130	145	180
Diameter		45	55	65	75	85	95	110	130	145	180
Length		979	1.108	1.328	1.465	1.550	1.732	1.751	1.740	2.010	2.212
Weight		9	14,4	25	34	46	65	96	117	168	260
Air consumption		0,35	0,4	0,7	1,0	0,95	1,5	1,6	2,6	3,4	4,5
Thrust control	No. of strokes	1st gear 530 | 2nd gear 615	1st gear 470 | 2nd gear 565	1st gear 450 | 2nd gear 550	1st gear 385 | 2nd gear 480	1st gear 370 | 2nd gear 470	1st gear 325 | 2nd gear 425	1st gear 320 | 2nd gear 380	1st gear 320 | 2nd gear 400	1st gear –	1st gear –
	Servo control	–	–	460	400	370	325	320	320	310	260
Pipe Ø ≤		32	45	50	63	75	85	90	110	125	160

All data without guarantee

TYP		S45	S65	S75	S95	S110	S130
Diameter		45	65	75	95	110	130
Length		894	1.097	1.295	1.532	1.548	1.604
Weight		8	18	28	56	86	107
Air consumption		0,35	0,65	0,8	1,3	1,4	2,4
Thrust control	No. of strokes	1st gear 580 | 2nd gear –	1st gear 570 | 2nd gear –	1st gear 490 | 2nd gear –	1st gear 370 | 2nd gear –	1st gear 370 | 2nd gear –	1st gear 370 | 2nd gear –
	Servo control	–	640	460	370	370	370
Pipe Ø ≤		32	50	63	85	90	110

All data without guarantee

GRUNDOMAT in detail. More at

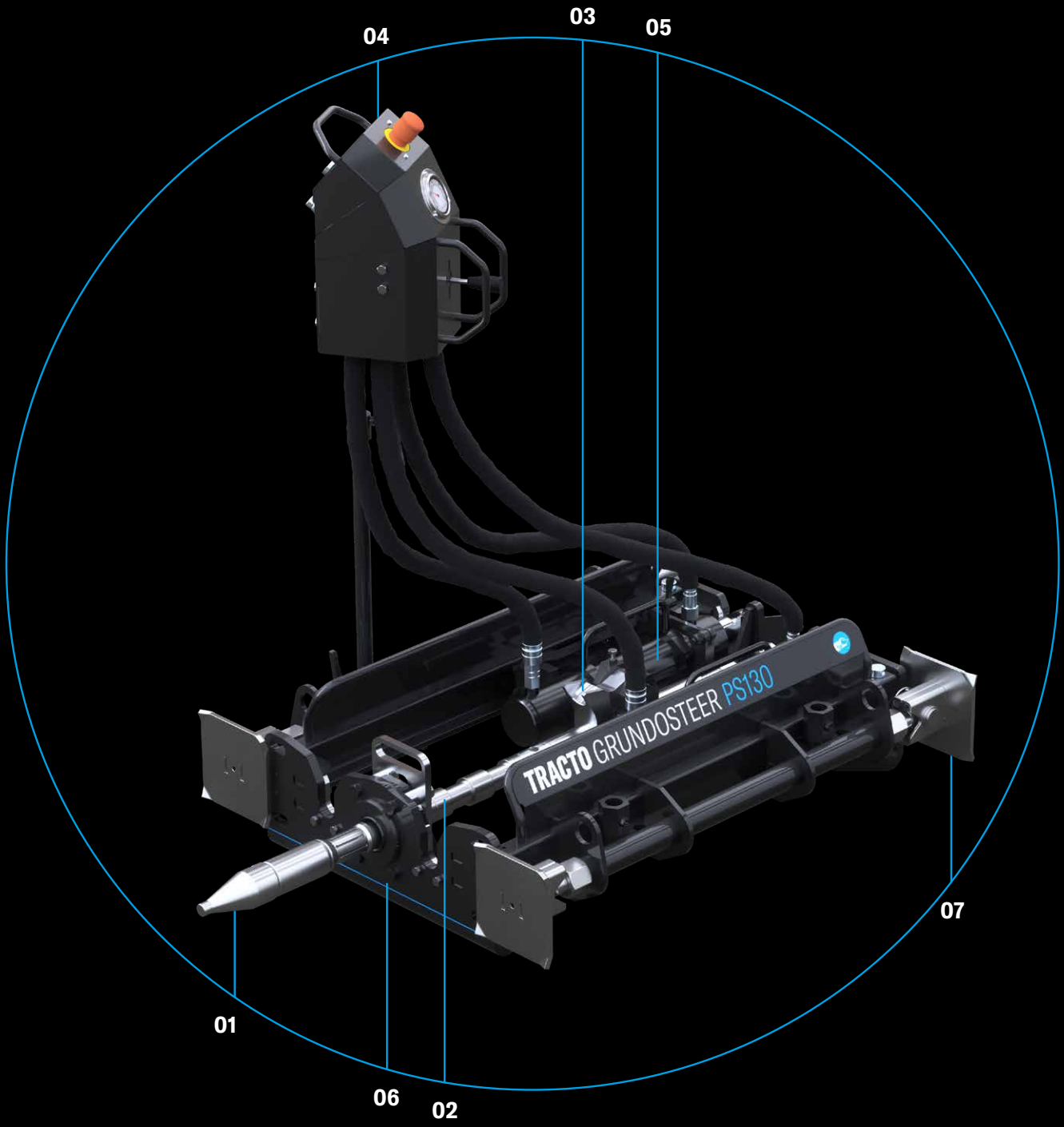
TRACTO.COM/
GRUNDOMAT

DUAL SUSTAINABILITY

New house connections for eco-electricity with the soil displacement hammer

Project:	The power supply of the city of Landsberg is 100% hydroelectric. Renovation work on the pavements and cycle paths on Hindenburgring, a partially four-lane road in the old town, was used there to replace old electricity house connections with the soil displacement hammer with new OD 63 mm pipes over lengths of 6 m, 11 m, 5 m, 8 m and 4 m.
Client:	Stadtwerke Landsberg
Execution:	E.K.L. GmbH
In use:	GRUNDOMAT 75
Duration:	3 working days

GRUNDOSTEER GUIDED ROD PUSHER SIMPLY FULL TARGET CONTROL



APPLICATIONS

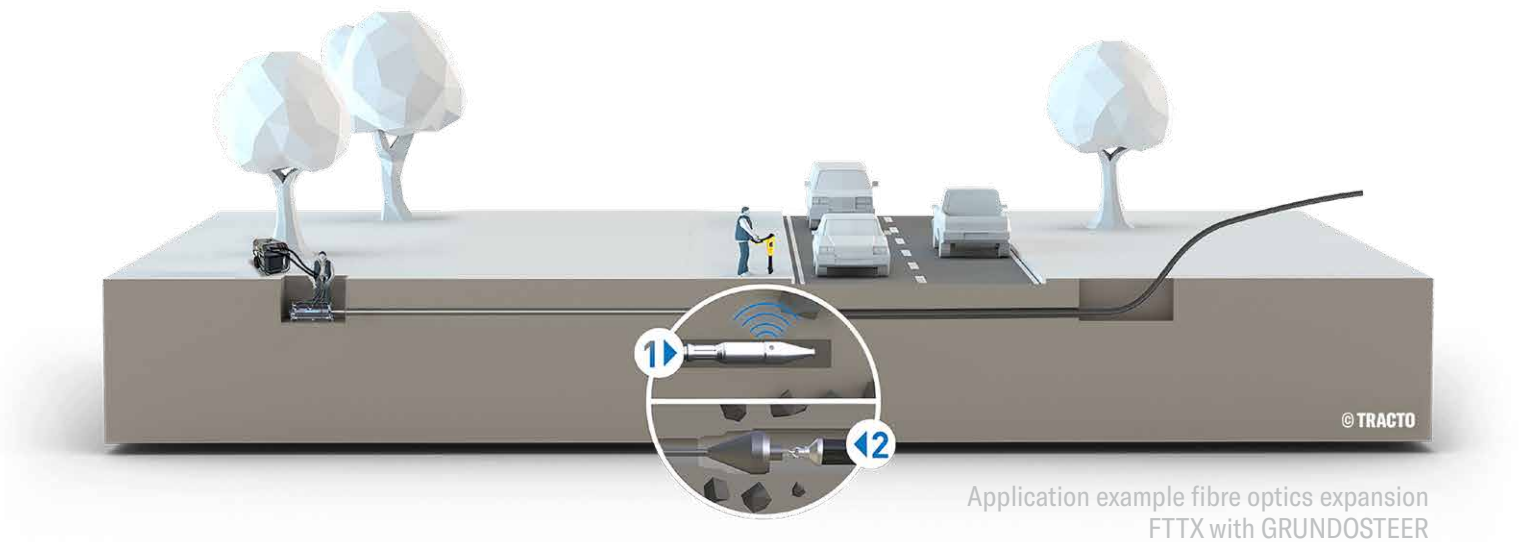
01 Adjustable steering head with integrated sonde
02 Robust SIMCON rods
03 Insensitive thrust ratchet
04 Easy to operate, height-adjustable control unit
05 Adjustable insertion position of the hydraulic cylinders
06 Dismountable base frame
07 Integrated stabiliser

GRUNDOSTEER PS130

GRUNDOSTEER GUIDED ROD PUSHER – By combining static soil displacement and easy correction of the driving direction, the GRUNDOSTEER bridges the gap between the GRUNDOPIT mini HDD rigs and the GRUNDOMAT soil displacement hammers.

With the GRUNDOSTEER, a pilot bore is initially carried out along the planned bore path. Meanwhile, the locatable head is tracked above ground with a locating device. This way, deviations from the route can be detected and, if necessary, corrected by rotating the rods in the desired direction. Upon arrival at the target, the head is replaced by an expander and the attached pipe is installed as it is pulled back. However, the use of drilling fluid is not necessary with rod pushing.

The robust and compact GRUNDOSTEER can work from a pit to the building or from the building through a core hole in the house wall. Thanks to the reliable guiding principle and uncomplicated directional correction, even less experienced operators can produce trenchless on-target house connections or short undercrossings.



Application example fibre optics expansion
FTTX with GRUNDOSTEER

FACTS

INSTALLATION METHOD

STEERABLE UP TO 25 M

NON-STEERABLE

PIPE DIAMETER

MAX. 100 MM Ø

MAIN AREAS OF APPLICATION

LONGITUDINAL BORES

UNDER-CROSSINGS

PIT AND CELLAR START POSSIBLE

IN FIVE SENTENCES

1
Perfect symbiosis

The GRUNDOSTEER combines proven trenchless methods in one easy-to-use device. As with the soil displacement hammer, the soil is displaced as the rods are pushed forward. The guiding principle and the pipe installation in two steps are similar to the HDD mode.

2
Flexible pit starter

The guided rod pusher is ideal for establishing all types of house connections from the pit to the building or in the opposite direction in all displaceable soils. Even short undercrossings are possible with the GRUNDOSTEER in a quick and easy way.

3
Clever head

With the GRUNDOSTEER, the direction is constantly controlled by locating the guiding head and can be corrected at any time. To do this, the position of the head is simply read off the time scale on the rod connector and the direction is changed, if necessary, by rotation.

4
Favourable starter

The investment for the GRUNDOSTEER including accessories is relatively low. An existing GRUNDOSCOPE aiming frame can be used for target alignment. A simple locating device is sufficient for location and a customary hydraulic power unit is sufficient as a drive.

5
Ergonomic lightweight

The base frame of the GRUNDOSTEER can be dismantled into individual parts, the rods have a force-saving bolt connection. The height-adjustable control panel allows comfortable working while standing, the feed speed is regulated by a smooth-running hand lever.

PERFORMANCE DATA

TYPE	GRUNDOSTEER PS130
Pullback/thrust force (kN)	130
Length (mm)	995
Width (mm)	760
Centre axis (mm)	120
Weight (kg)	170
Base frame individual parts (kg)	< 54
Rod Ø (mm)	45 x 500
Rod weight (kg)	5,7
Guiding head Ø (mm)	58
Max. expanding Ø (mm)	100

All data without guarantee

GRUNDOSTEER in detail. More at

TRACTO.COM/ GRUNDOSTEER

BROADBAND EXPANSION IN BERLIN

Guided rod pushing method enables pipe installation under tram tracks

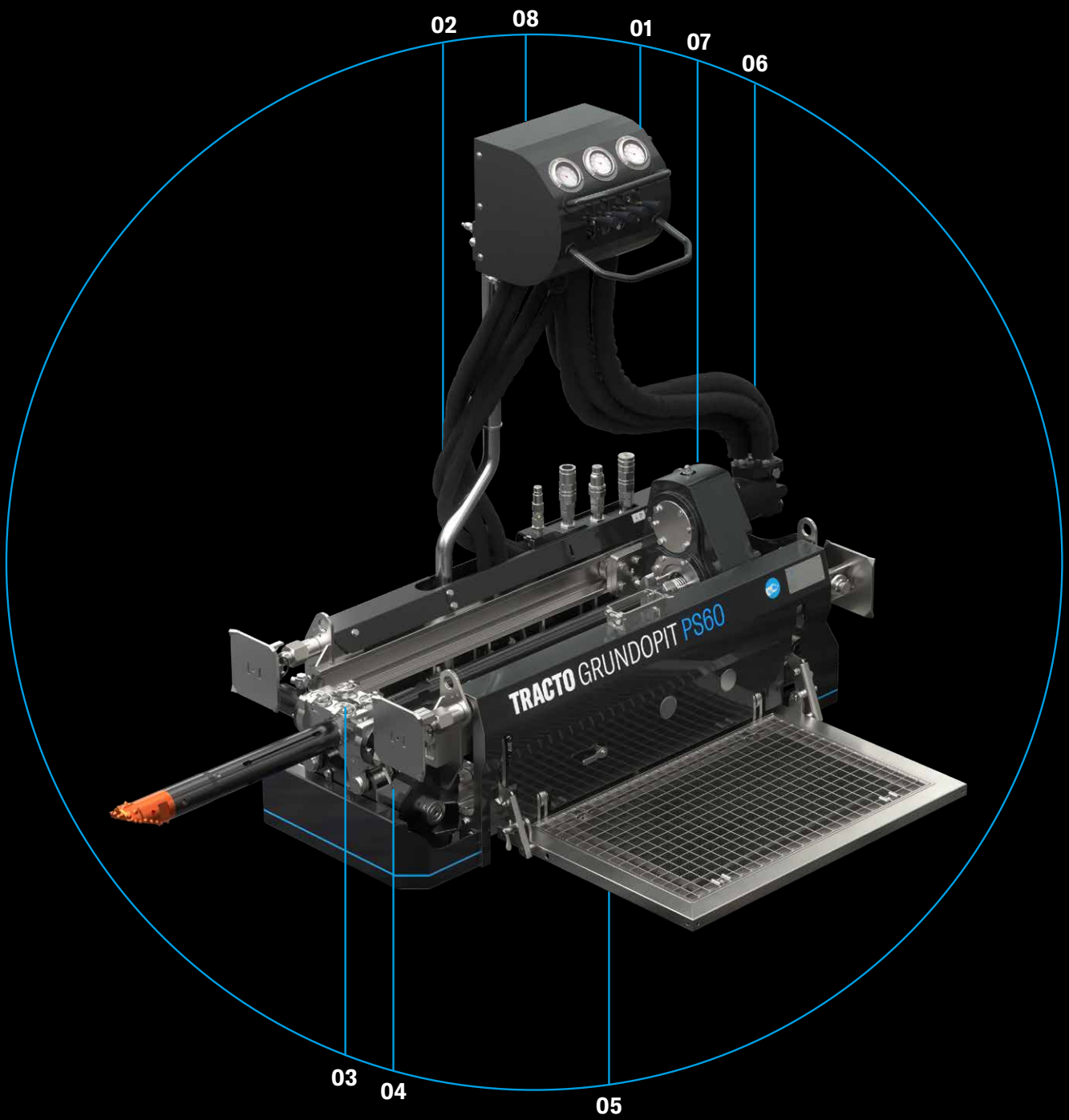
Project: As part of broadband expansion, three OD 50 PE pipes were installed in a bundle under the 'Breite Straße' road in Berlin-Pankow, in the middle of which a tramway with two rail tracks runs. The use of a soil displacement hammer was not authorised due to low coverage. Although the overhead tram line made it difficult to locate the pilot bore, the target was hit and the pipe bundle was pulled in without any problems.

Execution: F+E Tiefbau

In use: GRUNDOSTEER PS130

Duration: 1 working day

GRUNDOPIT
MINI FLUID-ASSISTED HDD RIGS
SMALL
POWERHOUSES



APPLICATIONS

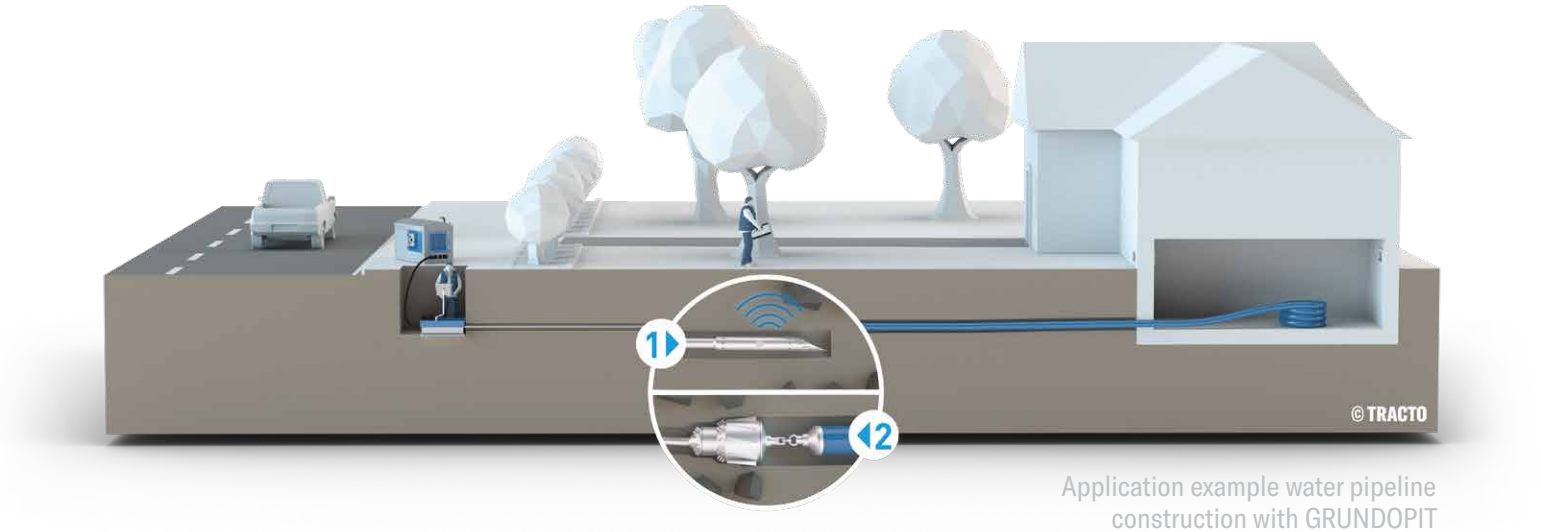
01 Connecting the hydraulic lines
02 Drill rod effective length 750 mm
03 Hydraulic clamp for rod change
04 Thrust via cylinder drive
05 Fold-out work platform
06 Twin-step rotation
07 Hydraulic tensioning in the working pit
08 Fold-out control panel

GRUNDODPIT PS60

GRUNDOPIT MINI FLUID-ASSISTED HDD RIGS are used when the bore path requires the steerability of the drilling head. This is the case within existing infrastructures, in confined spaces, challenging terrains such as slopes and/or difficult soils.

With the compact, easy-to-handle small bore rigs, house connections for gas, water, electricity, fibre optic and sewage lines as well as longitudinal installations up to 100 m in length can be made quickly and economically. House connection service lines can be installed with the GRUNDOPIT HDD rigs up to a small pit in front of the building, directly into the building or the cellar and in each case in the opposite direction. In this way, these mini drilling rigs close the gap between steerable midi GRUNDODRILL flush drilling rigs and non-steerable GRUNDOMAT soil displacement hammers.

Depending on the type of bore, pipe diameter, soil type, bore length and degree of difficulty, a choice can be made between two GRUNDOPIT models for starting from a pit or manhole.



Application example water pipeline construction with GRUNDOPIT

FACTS

INSTALLATION METHOD

STEERABLE

NON-STEERABLE

PIPE DIAMETER

UP TO 200 MM Ø

MAIN AREAS OF APPLICATION

- HOUSE CONNECTIONS
- PIT AND CELLAR START POSSIBLE
- LONGITUDINAL BORES
- UNDER-CROSSINGS

SPECIAL APPLICATIONS

- DRILLING IN ROCK

IN FIVE SENTENCES

1

Small quick starters

The GRUNDOPIT mini HDD rigs are ready for use in no time at all. A truck-mounted crane or mini-excavator is completely sufficient for handling. And thanks to the compact dimensions of the rigs, only small excavation pits are required, which are quickly made and cause only minimal excavation.

2

Steerable house mates

Thanks to their steerability, the GRUNDOPIT mini HDD rigs are virtually predestined for making house connections under difficult conditions: right into a small pit in front of the building, directly into the building or the cellar and in the opposite direction in each case.

3

Compact powerhouses

Despite their compact dimensions, the GRUNDOPIT mini drill rigs are very powerful. Push and pull forces of up to 60 kN paired with high torques and speeds enable the installation of pipes even through challenging soils. The robust design comes on top of that.

4

Speedy high-flyer

With the super-compact GRUNDOPIT PS40, it is possible to drill flat over existing cable networks from a pit that is only 1 m wide. This is particularly practical for establishing fibre-to-the-home (FTTH) connections quickly and directly from the pavement.

5

Little Toughies

Using the right accessories, even the hardest ground is no problem for the powerful mini-HDD rigs. With an air-driven hammer bore head for the pilot bore and a hole opener for expanding, the GRUNDOPIT can even get through rock.

PERFORMANCE DATA

TYPE	GRUNDOPIT PS40	GRUNDOPIT PS60
Thrust and pullback force	40 kN	60 kN
Max. Torque	1.000 Nm	1.500 Nm
Drill rod Ø	45 mm	51 mm
Rod length | Number	500 mm	750 mm
Pilot bore Ø	65 mm	80 mm
Lx W x H (transport position)	955 x 1.175 x 895 mm	1.375 x 620 x 880 mm
Lx W x H (working position)	955 x 1.175 x 1.500 mm	1.385 x 1.100 x 1.450 mm
Expanding-Ø* ≤	150 mm	250 mm
Pipe outer Ø* ≤	110 mm	200 mm
Bore length* ≤	40 m	80 m

* Depending on soil | All data without guarantee

STEEP RISE FOR MINI-HDD RIG

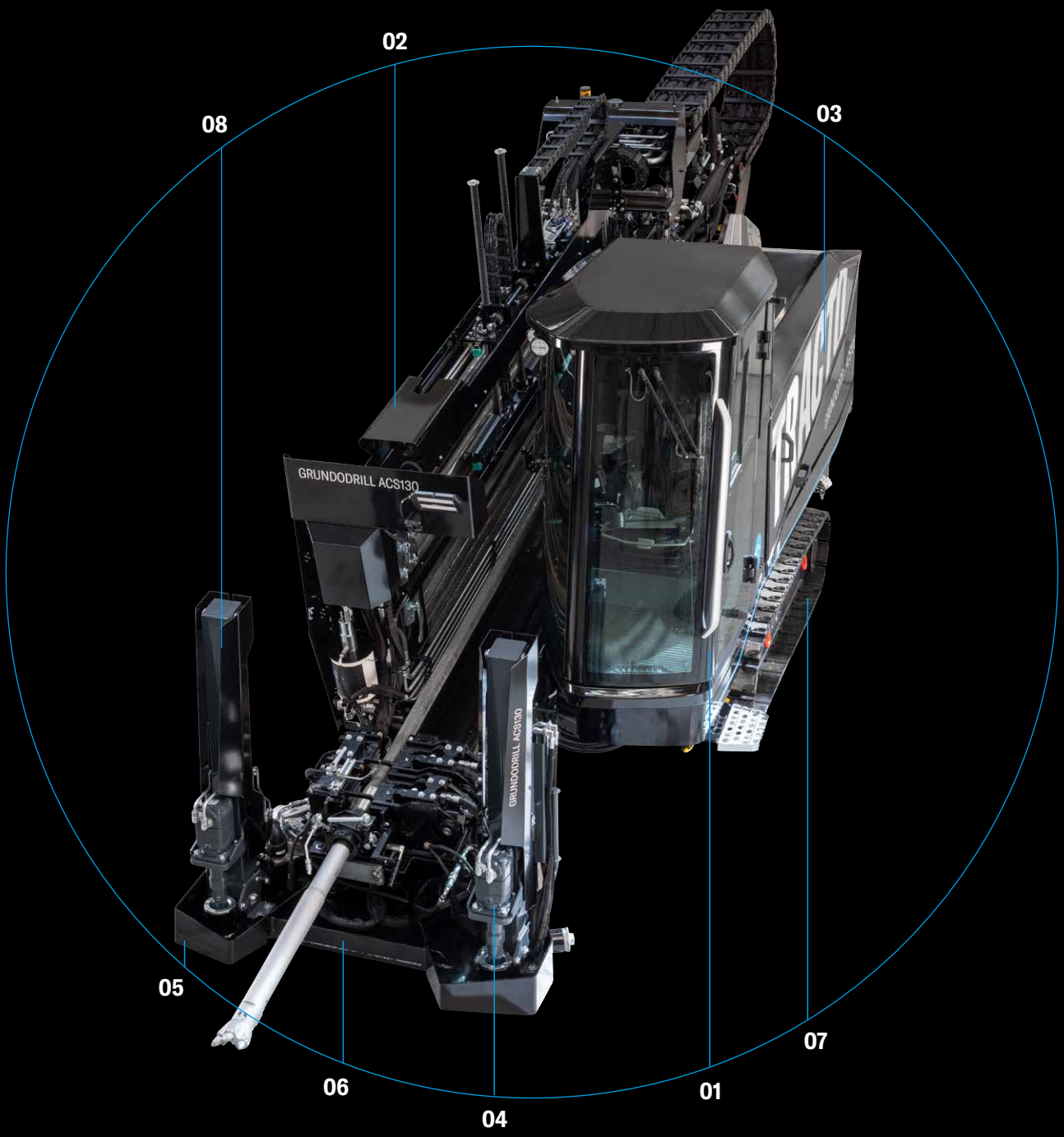
No alternative to trenchless: New water connection through a steep slope

Project:	For a new water house connection, a 46 m long pipe was installed from the street through a steep slope directly into the customer's house. The bore ran underneath existing buildings, under stairs, under a hallway and a paved terrace, a garden bed, a meadow and various pathways.
Client:	Private customer / KV Cochem-Zell
Execution:	Oliver Pöllmann GmbH
In use:	GRUNDOPIT PS60
Duration:	1 1/2 working days

GRUNDOPIT in detail. More at

TRACTO.COM/ GRUNDOPIT

GRUNDODRILL FLUID-ASSISTED HDD RIGS ALWAYS ONE TURN AHEAD



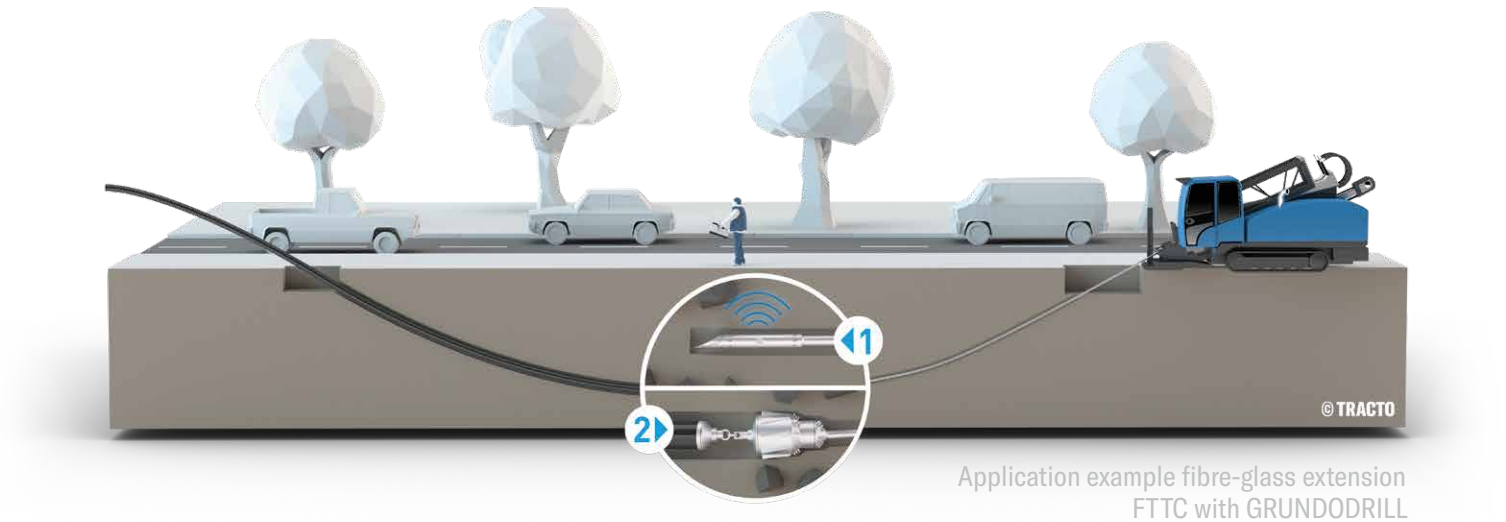
APPLICATIONS

01 Comfort cabin with various equipment options
02 Optimum drill rod handling with fully automatic loading system
03 High rotation and rinsing capacities, powerful drive
04 Optional anchor drilling system for high stability
05 Anchor plate as a catch basin for the drilling fluid
06 Support plates for alignment and positioning
07 Undercarriage with rubberised steel tracks, with various chain versions
08 Hydraulic loading crane for self-sufficient drill rod handling

GRUNDODRILL FLUID-ASSISTED HDD RIGS - Horizontal directional drilling (HDD) is one of the most complex, but also most versatile and flexible trenchless technologies. With this method, the first step is to create a pilot bore is along a flexibly plannable bore path with the HDD rig's steerable drilling head. When the drill rods are pulled back, the borehole is enlarged by an expander head and the attached pipe is pulled into the bore path. An organic drilling fluid supports the process. This way, pipelines can be installed under or along traffic routes and bodies of water, even in rocky ground.

The powerful and versatile GRUNDODRILL Midi-HDD rigs in the performance classes from 50 to 300 kN convince with innovative technical solutions in combination with high flexibility and loading capacity. This makes them particularly productive and economical. With special software solutions for fleet management, documentation and planning, productivity can be further increased individually.

Thanks to the all-round glazing of the comfort cabin, the operator has the best possible all-round view of the jobsite without having to swing out the cabin. The latest GRUNDODRILL generation allows particularly effective work and even remote-controlled drilling thanks to an intuitive operating concept with a high degree of automation.



Application example fibre-glass extension
FTTC with GRUNDODRILL

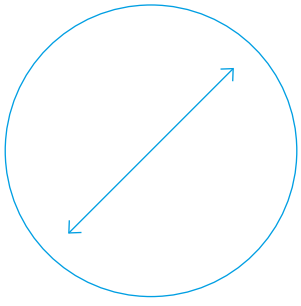
FACTS

INSTALLATION METHOD

STEERABLE

NON-STEERABLE

PIPE DIAMETER



100 – 710 M Ø

MAIN APPLICATIONS

- LONGITUDINAL BORES
- UNDER-CROSSINGS
- CABLE GUIDED DRILLING
- ROCK BORES

SPECIAL APPLICATIONS

- HORIZONTAL DRINKING WATER WELLS
- IRRIGATION & DRAINAGE
- GEOTECHNICAL APPLICATIONS
- FURTHER INNOVATIVE APPLICATIONS

IN FIVE SENTENCES

1

Versatile multi-talents

Longitudinal bores, undercrossings, rock drilling or cable-guided drilling for locating in difficult terrain, you can do it all with the versatile GRUNDODRILL HDD rigs. Perfectly matched drilling tools guarantee optimum drilling progress in any soil.

2

Premium value

Like all Nodig systems from TRACTO, the GRUNDODRILL rigs stand out for their premium quality. Our in-house production uses only high-quality steel, which is elaborately tempered. In addition, we only install first-class components and put all parts through their paces.

3

Top Performer

All GRUNDODRILL models achieve high rotation and flushing performance with low consumption of resources and operating materials. In combination with their long service life and low wear, the fluid-assisted HDD rigs "Made in Sauerland" are particularly efficient and economical.

4

Mobile control

The fluid-assisted HDD rigs of the GRUNDODRILL JCS/ACS series are fully remote controllable even in drill mode. All functions can be conveniently controlled from outside the operator's ca bin. The hard-wearing remote stands up to even the toughest jobsite conditions.

5

Comfort workplace

Whether with or without remote control - all GRUNDODRILL rigs offer maximum operating comfort. Whether it's the convenient control via joysticks, the all-round glazing of the cabin for optimum visibility or the spring-mounted comfort seat - a workplace you won't want to leave.

PERFORMANCE DATA

TYPE	GRUNDODRILL JCS/ACS 130	GRUNDODRILL 15XP / 15XPT	GRUNDODRILL 15XPT
Thrust and pullback force	130 kN	147	160 kN
Max. Torque	EL-D80/EL-D67: 4.500 Nm; EL-D80 (Inner rod): 1.200 Nm	4.500 Nm	6.500 Nm
Effective rod length | Quantity	3.000 mm | 40/56 St.	3.000 mm | 70 St.	3.000 mm | 60 St.
Pilot bore Ø	EL-D80: 140 mm | EL-D67: 100 mm	100 mm	115 mm
L x W X H (cabin folded in)	7.020 - 7.484 x 1.910 x 2.782 mm	Fully-automatic: 6.500 x 1.850 x 2.400 mm	Semi-automatic: 6.380 x 1.850 x 2.400 mm
L x W X H (cabin folded out)	30°: 7.175 - 7.537 x 2.577 x 4.652 mm	7.250 x 2.900 x 2.700 mm	Width with mud pump: 7.250 x 3.100 x 2.700 mm
Engine type | Power	Cummins F3.8 | 115 kW	Cummins B4.5 - C165 | 123 kW	Cummins B4.5 - C165 | 123 kW
Upsizing-Ø* ≤ | Pipe outer Ø* ≤	JET-mode: 500/400 mm; Rock-mode: 355/250 mm	500 mm | 400 mm	500 mm | 400 mm
Bore length* ≤	JET-mode: 300 m; Rock-mode: 200 m	350 m	400 m

TYPE	GRUNDODRILL 18N	GRUNDODRILL 18CS	GRUNDODRILL 28NPLUS
Thrust and pullback force	180 / 200kN	180 kN	280 kN
Max. Torque	Outer rod: 7.500 Nm; Inner rod: 2.500 Nm	Outer rod: 7.500 Nm | 10.000 Nm	11.000 Nm
Effective rod length | Quantity	3.000 mm | 40 St.	3.000 mm | 75 / 70 St.	3.000 mm | 96 St.
Pilot bore Ø	165 mm	73/63 mm	140/170 mm
L x W X H (cabin folded in)	6.700 x 2.350 x 2.620 mm	6.700 x 2.350 x 2.620 mm	7.600 x 2.530 x 2.900 mm
L x W X H (cabin folded out)	7.150 x 2.350 x 3.150 mm	7.150 x 2.350 x 3.150 mm	7.750 x 3.420 x 3.750 mm
Engine type | Power	Cummins B4.5-C165 | 123 kW	Cummins B4.5-C165 | 123 kW	Cummins B6.7-C300 | 224 kW
Upsizing-Ø* ≤ | Pipe outer Ø* ≤	600/500 mm	600/500 mm	900 mm | 710 mm
Bore length* ≤	≤ 400 m	≤ 400 m	500 m

* Depending on soil | All data without guarantee

GRUNDODRILL in detail. More at

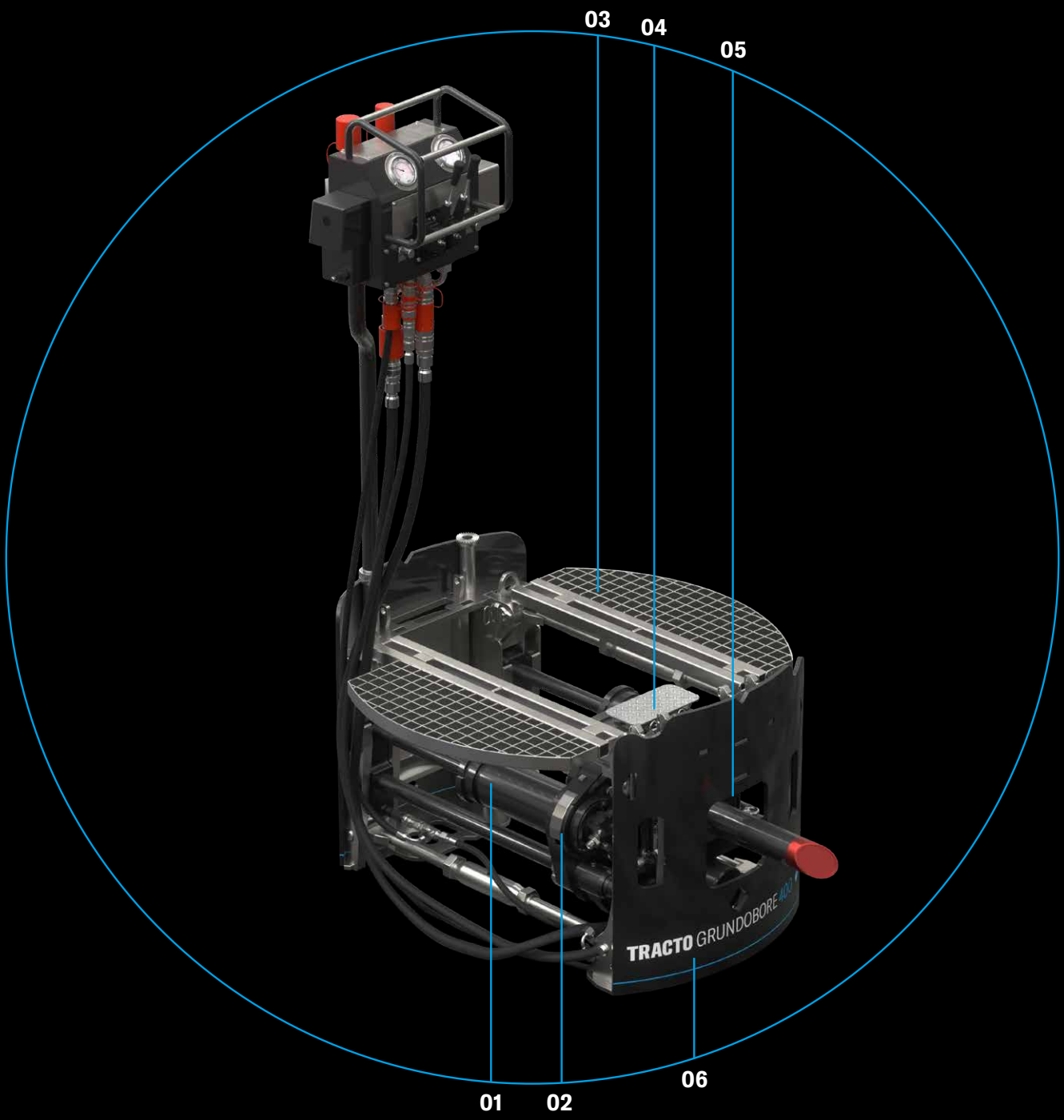
TRACTO.COM/
GRUNDODRILL

INTO THE SEA WITH HDD

Gentle installation of a seawater transport pipeline in the Baltic Sea

Project:	In order to supply the seawater spa 'Grömitzer Welle' with water from the Baltic Sea, a new 160 mm OD transport pipeline was installed from the connection point of the existing pipeline on the beach to the extraction point in the Baltic Sea. Divers were used to connect the approximately 400 m long pipeline underwater at a depth of 3.80 m.
In use:	GRUNDODRILL 28Nplus
Client:	Tourismus Service Grömitz
Execution:	Paasch Rohrleitungsbau GmbH & CO. KG
Duration:	3 days for pilot bore and pipe pulling

GRUNDOBORE
AUGER BORING UNIT
THE PRECISE



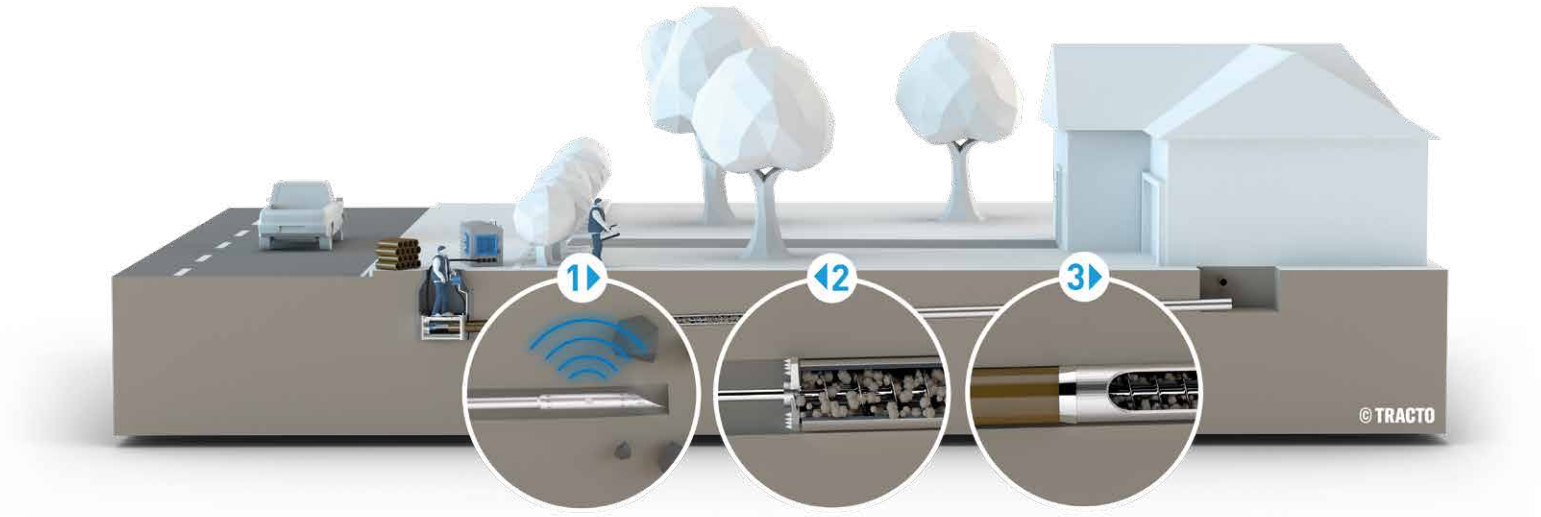
APPLICATIONS

01 Large number of strokes with extremely short installation lengths
02 Compact, powerful rotary drive for large pipe diameters
03 Galvanised grating as a safe standing surface
04 Locking the thrust via foot pedal
05 Mechanical, positive-locking rod clamp
06 Semi-circle support plates for secure bracing in the manhole

GRUNDOBORE AUGER BORING UNIT - The hydraulically driven GRUNDOBORE 200S is a robust and powerful press drilling system for the installation of sewer house connections as well as product and protection pipes up to OD 280 from a 1 m round manhole or an extremely small excavation pit.

A distinction is made between non-steerable and steerable pilot pipe installations. The steerable version with GHRUNDOBORE 200S achieves particularly high positioning accuracies, as required e.g. in canal construction or when driving under railway tracks. In both types of tunnelling, a pilot drill pipe is first driven displacing the ground. Then an auger is connected to the drill pipe, which transports the soil into the target pit during retraction. At the same time, protective pipes are pulled in, into which the product pipes are finally pressed.

A special application of the GRUNDOBORE 200S is the renewal of sewage house connections.



Application example for sewage pipe construction with GRUNDOBORE 200S

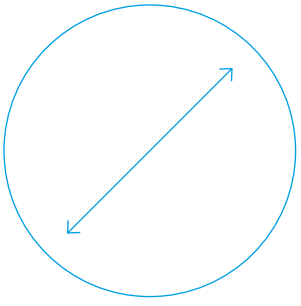
FACTS

INSTALLATION METHOD

STEERABLE

NON-STEERABLE

PIPE DIAMETER



UP TO 280 MM

MAIN AREAS OF APPLICATION

SEWAGE HOUSE CONNECTIONS

UNDER-CROSSINGS

SPECIAL APPLICATIONS

BURSTING METHOD

IN FIVE SENTENCES

1

Quite relaxed

The auger boring method has been tried and tested in all displaceable soils. Because the pipe insertion is completely rotation-free, the GRUNDOBORE 200S can be used wherever any movement in the soil should be avoided, for example under railway tracks.

2

Super precise

When positional accuracy has top priority, such as in sewer construction, the press-drilling method with steerable pilot pipe pushing is used. It is suitable for installing pipes up to ND 1200 mm over lengths of up to 120 m with a positional accuracy of no less than 0.1 %.

3

Extremely compact

The compact auger boring rig can be started from an extremely small excavation pit, even in places that are difficult to access such as basements or underground garages - and even from a 1 m circular manhole. This works because the GRUNDOBORE 200S can be disassembled into single system components - which is also very practical for transport.

4

Well thought out

Using the steerable auger boring method with GRUNDOBORE 200S, pipes can be installed directly from out of a manhole or a pit. With a special start pit construction, it is also possible to bore in different directions.

5

Cleverly constructed

The design of the GRUNDOBORE 200S makes it easy to handle. The swivelling core bit guide guarantees precise drilling of the manhole wall. The drilling direction can be adjusted vertically by +/- 11 % after installation. And the rotary drive has a practical quick-release rod lock.

PERFORMANCE DATA

TYPE	GRUNDOBORE 200S
Max. Thrust	200 kN
Max. pulling force	250 kN
Cylinder stroke	280 mm
Max. Feed speed	2 m/min
Max. Torque	3.800 Nm
Max. Spindle speed	60 U/min
Max. Hydraulic pressure	250 bar
Length x width x height	960 x 570 x 630 mm
Weight	400 kg
Axle height/axle height when used with steel frame (pit start)	325/375 mm
Start manhole (circular shaft)	Ø 1 m
Length starting pit	1,2 m
Length target pit	1 m
Effective length pilot rod	450 mm
Diameter pilot rod	82,5 mm
WG pipe/useful length	450 mm
Max. Max. outer pipe diameter	280 mm
Max. Drilling length (depending on soil)	25 m

*Depending on soil | All data without guarantee

GRUNDOBORE in detail. More at

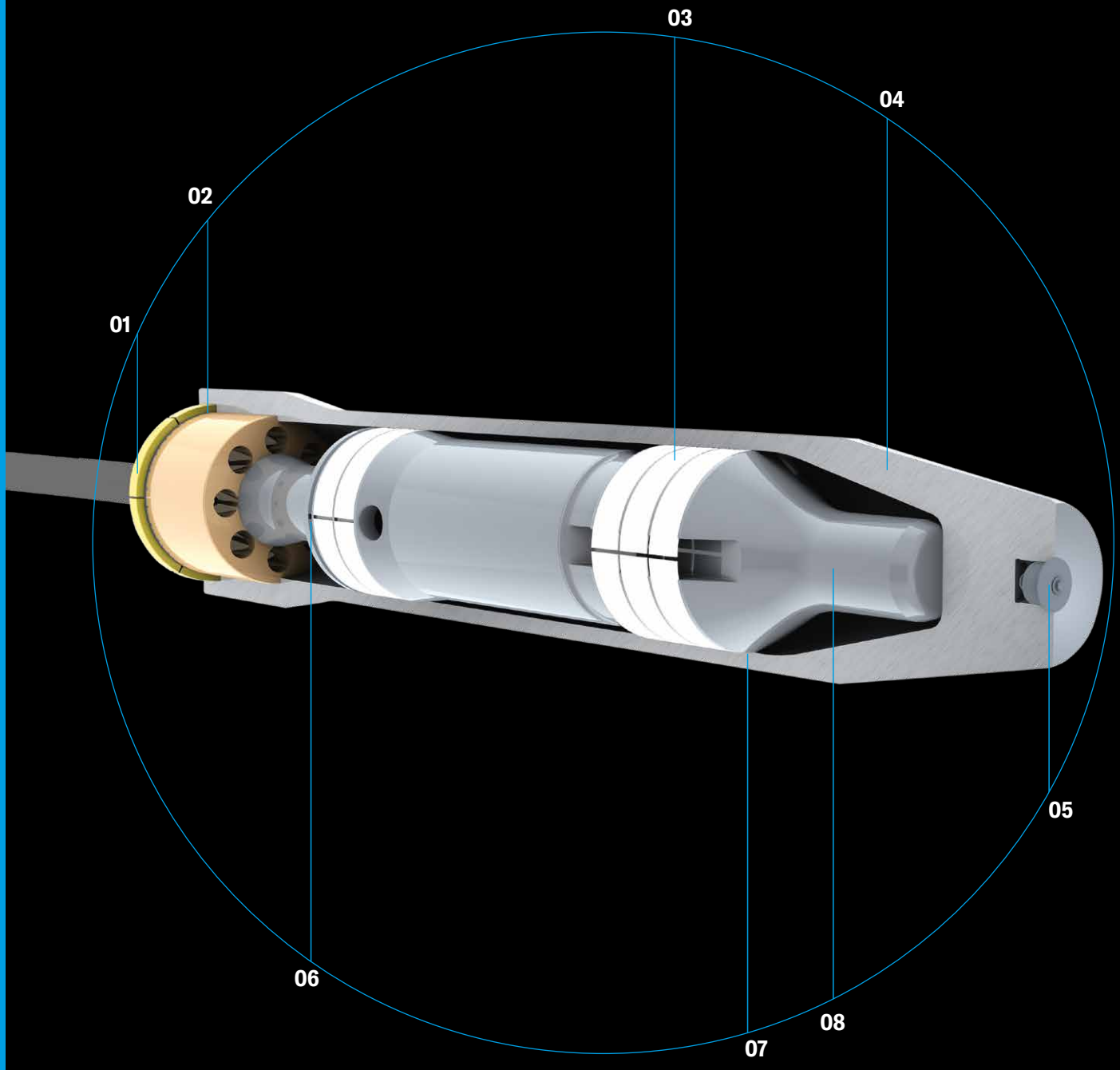
TRACTO.COM/ GRUNDOBORE

PRECISION BORE OUT OF A MANHOLE

Production of a sewer house connection with 5 % slope

Project:	A wastewater house connection in Wildeshausen was regularly blocked due to partial damage. As the road had only been renewed about two years ago, a decision was made to install a new sewer from the main line to the house service shaft in 18 m distance using the steerable auger boring method. The bore was set at a height of 3 m and had to maintain a gradient of 5 %. After the pilot bore and expansion, the new OD 170 PP-HM pipes could be inserted and connected from the manhole without any problems.
Client:	Private client
Execution:	Company Huneke
In use:	GRUNDOBORE 200S
Duration:	1 working day

GRUNDORAM PIPE RAMMERS
THE IMPACTFUL



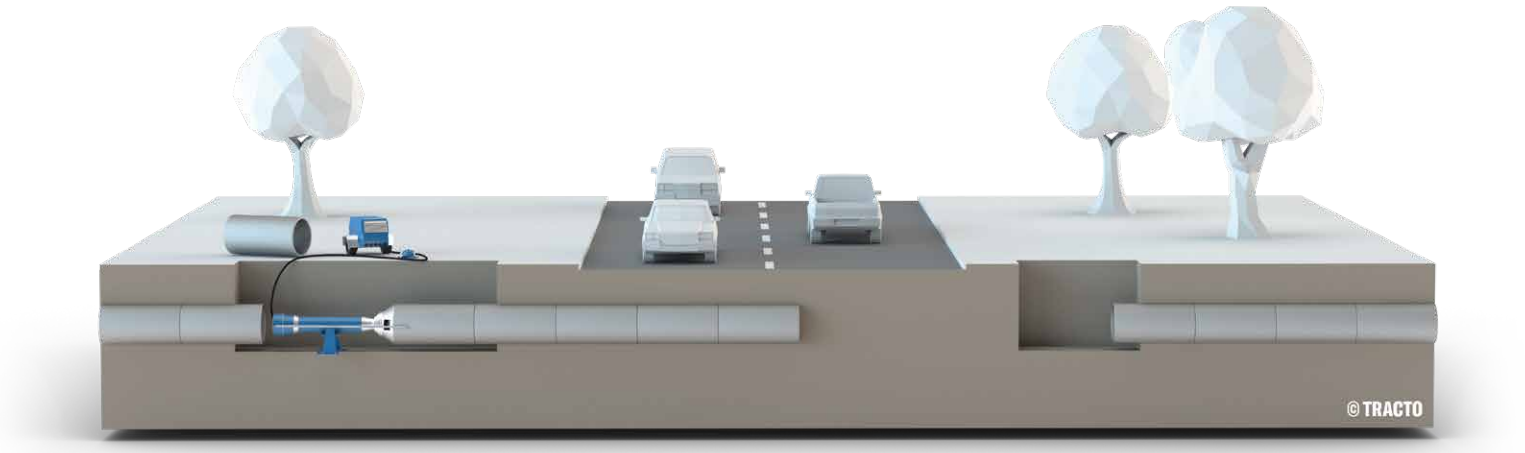
APPLICATIONS

01 Segment rings for securing the control stud
02 Permanently elastic mounted control stud
03 Piston seal rings prevent friction
04 Solid, one-piece housing - heavy duty
05 Thread for pulling eye for pipe sanitation application
06 Piston seals reduce air consumption
07 Inner chrome-plated housing
08 Two-piece piston - optimum vibration behaviour and reduction of the risk of breakage

GRUNDORAM pipe rammers - pipe ramming in all soil types except mud, swamps and non-displaceable, rocky soils and other horizontal and vertical applications.

The most common GRUNDORAM application is dynamic pipe ramming, where steel pipes up to ND 4,000 mm are driven under roads, railway tracks, buildings and rivers at low overcover without press abutments. Steel pipes are used as media pipes, e.g. in pipeline construction or as protection pipes for bundling supply and disposal lines, but also for drainage or for the construction of subways, smaller culverts and pipe screens for tunnel construction.

In addition to dynamic pipe ramming, the powerful and robust GRUNDORAM machines can be used to support HDD drilling (HDD Assist) and, with the appropriate accessories, as crackers for dynamic pipe renewal as well as vertically for foundation and pile foundations, well construction and the driving of sheet piles.



Application example pipeline construction with GRUNDORAM

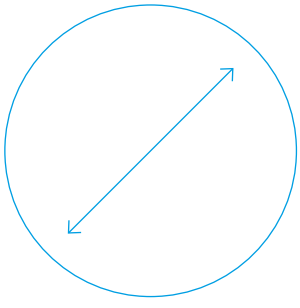
FACTS

INSTALLATION METHOD

STEERABLE

NON-STEERABLE

PIPE DIAMETER



UPTO 4,000 MM Ø

MAIN AREAS OF APPLICATION

- **UNDER-CROSSINGS**
- **PIPELINE CON-STRUCTION**

SPECIAL APPLICATIONS

- **PASSAGES & TUNNELS**
- **DRAINAGE**
- **HDD ASSIST & RESCUE**
- **VERTICAL - APPLICATIONS**
- **DYNAMIC PIPE RENEWAL**

IN FIVE SENTENCES

1
Strong & dynamic

The powerful GRUNDORAM pipe rammers are suitable for various applications in all displaceable soils. Their most common application is dynamic pipe ramming. For this, no pressing abutments are required, which significantly reduces set-up times. The short and mini machines are perfect for pipe-in-pipe ramming, where space is limited.

2
Powerful & accurate

With the GRUNDORAM, steel pipes up to no less than 4,000 mm in diameter can be driven particularly economically under roads, railway tracks and rivers. Because the pipe, which is open at the front, penetrates the ground and obstacles do not have to be displaced, pinpoint accuracy is guaranteed.

3
Productive & variable

By installing a pulling eye and combining the rammer with a compressor and a winch – then you have a GRUNDOCRACK system for dynamic pipe renewal. With it, damaged pipes made of brittle materials can be renewed in a closed construction method and rehabilitated using the calibre or TIP method.

4
Versatile & helpful

The GRUNDORAM is also ideal for successfully completing complicated HDD drilling operations. In the so-called HDD assist & rescue, you can use dynamic force to loosen stuck pipes or drill rods, for example. And when used vertically, a pile driver can be used to set piles, drive sheet piles and much more.

5
Hammer hard & indestructible

You can rely on the GRUNDORAM. The solid casing is produced from a forged piece. The piston is elaborately hardened on heavily stressed surfaces. The weight ratio between casing and piston is optimally determined. The driving power is correspondingly high, the wear correspondingly low - for all 13 models and the mini machines.

PERFORMANCE DATA

TYPE	DAVID	ATLAS	TITAN	OLYMP	HERKULES	GIGANT	KOLOSS
Machine-Ø	95 mm	130 mm	145 mm	180 mm	216 mm	270 mm	350 mm
Ø rear cone	112 mm	145 mm	160 mm	195 mm	235 mm	300 mm	400 mm
Length	1.490 mm	1.453 mm	1.545 mm	1.690 mm	1.913 mm	2.010 mm	2.341 mm
Weight	59 kg	95 kg	137 kg	230 kg	368 kg	615 kg	1.180 kg
Air consumption	1,2 m^3/min	2,7 m^3/min	4,0 m^3/min	4,5 m^3/min	6,5 m^3/min	12,0 m^3/min	20,0 m^3/min
No. of strokes	345 min^{-1}	320 min^{-1}	310 min^{-1}	280 min^{-1}	340 min^{-1}	310 min^{-1}	220 min^{-1}
Impact energy	230 J	420 J	800 J	890 J	1.440 J	2.860 J	6.820 J
From pipe size	50 ND	50 ND	100 ND	100 ND	120 ND	200 ND	280 ND

TYP	GOLIATH	TAURUS	APOLLO	MINI-ATLAS	MINI-OLYMP	MINI-GIGANT
Machine-Ø	460 mm	600 mm	800 mm	125 mm	180 mm	270 mm
Ø rear cone	510 mm	670 mm	900 mm	140 mm	230 mm	330 mm
Length	2.852 mm	3.645 mm	4.400 mm	946 mm	1.080 mm	1.230 mm
Weight	2.465 kg	4.800 kg	11.500 kg	60 kg	175 kg	460 kg
Air consumption	35,0 m^3/min	50,0 m^3/min	100 m^3/min	1,7 m^3/min	3,5 m^3/min	10,0 m^3/min
No. of strokes	180 min^{-1}	180 min^{-1}	180 min^{-1}	580 min^{-1}	500 min^{-1}	430 min^{-1}
Impact energy	11.600 J	18.600 J	40.500 J	180 J	720 J	2.000 J
From pipe size	380 DN	380 DN	600 DN	50 DN	100 DN	200 DN

All data without guarantee

GRUNDORAM in detail. More at

TRACTO.COM/ GRUNDORAM

STROKE FOR STROKE TO THE TARGET

ND 2000 steel pipe ramming under Zurich's Laubegg tram loop

Project: Right in the centre of Zurich on Uetlibergstrasse, the dynamic pipe ramming method was used as part of a new sewer construction project to connect a section to the sewer network using the closed construction method. Along the 18 m long route in the middle of the roadway and under tram tracks, several power blocks, an existing sewer and a gas pipeline had to be passed under.

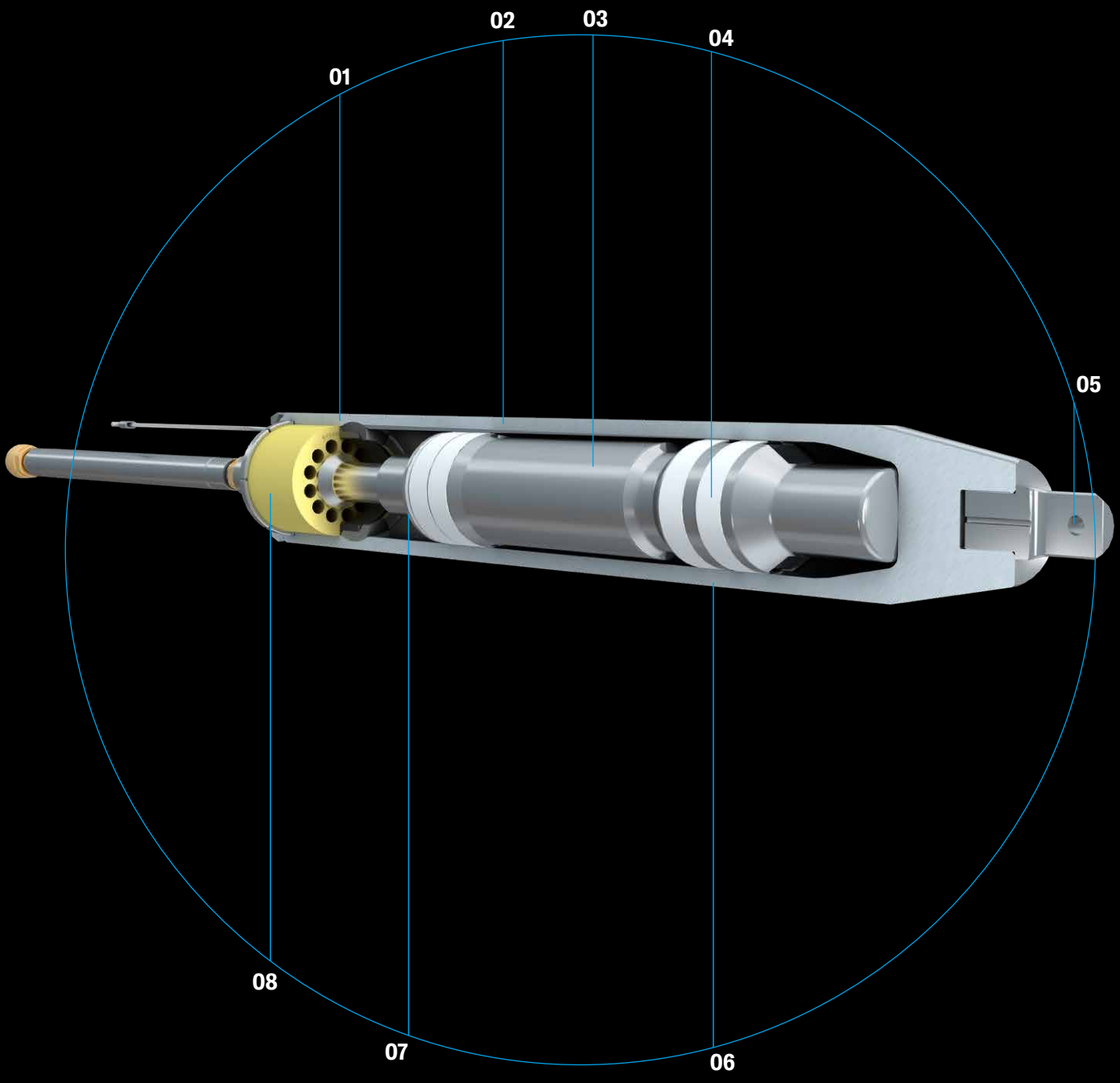
Client: Civil Engineering Office of the City of Zurich.

Execution: Zehnder Spezialbau AG

In use: GRUNDORAM Goliath

Duration: 1 1/2 weeks

GRUNDOCRACK
DYNAMIC PIPE BURSTING SYSTEMS
DYNAMICALLY PRODUCTIVE



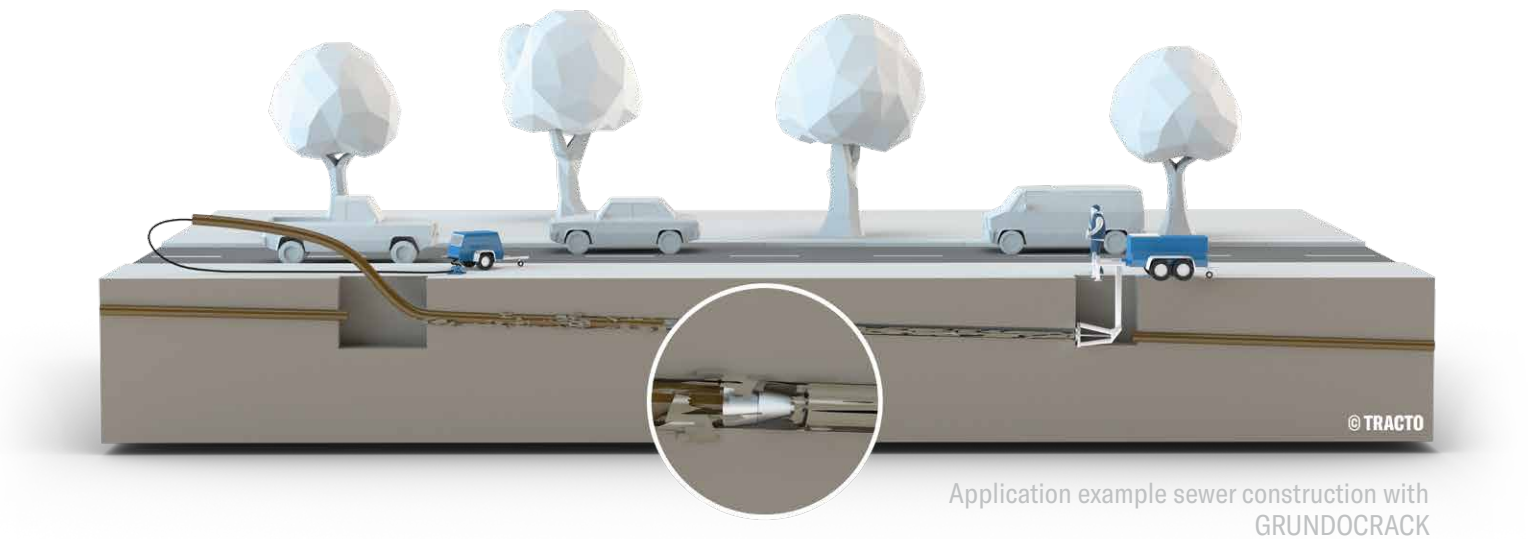
APPLICATIONS

01 Inside and outside chrome-plated, low-wear housing
02 Solid , one-piece casing without welding seams or screwed connection
03 Solid , tempered piston for high strength and durability
04 Piston seal rings prevent friction
05 Drawbar eye for rope connection for targeted guidance
06 Smooth machine body for recovery in new pipe where space is limited
07 Piston seal minimises air consumption and increases performance
08 Permanently elastic mounted control system protects material

GRUNDOCRACK DYNAMIC PIPE BURSTING SYSTEMS – The GRUNDOCRACK machines are modified horizontal rammers driven by compressed air. They are equipped with a reverse gear so that the accessories can be dismantled quickly and ergonomically and the machines can be recovered easily even in confined spaces.

The GRUNDOCRACK machines are particularly suitable for the dynamic renewal of defective pipelines made of brittle materials in the existing route. In the process, the old pipe is broken up with dynamic impact energy and displaced into the surrounding soil. At the same time, new pipes made of PE-HD (long or short pipes) or PVC-U of the same or larger cross-section are pulled in. A cable winch supports the pipe cracker and guarantees safe guidance through the defined bore path with its pulling force.

In addition to pipe renewal using the dynamic bursting method, the GRUNDOCRACK can also be applied for pipe rehabilitation using the calibre bursting or TIP method and, with the appropriate accessories, as a pile driver for dynamic steel pipe ramming.



Application example sewer construction with GRUNDOCRACK

FACTS

INSTALLATION METHOD

STATIC

DYNAMIC

NEW PIPE OUTER-DIAMETER

225 – 560 MM*

MAIN AREAS OF APPLICATION

- **RENEWAL OF PRESSURE PIPES**
- **RENEWAL OF FREE-FLOW PIPES**

SPECIAL APPLICATIONS

- **REHABILITATION**
- **DYNAMIC PIPE INSTALLATION**

*depending on machine type

IN FIVE SENTENCES

1
Proven combination

The dynamic bursting method, i.e. the combination of dynamic pile driving energy and the pulling force of a winch, is the longest proven method for underground pipe renewal. The simple but efficient procedure was developed more than forty years ago and is still used worldwide today.

2
Purposeful guidance

With the GRUNDOWINCH pulling winch, the guidance of the GRUNDOCRACK is statically supported by means of a steel cable in the old pipe. The winch is designed in such a way that the tension of the pulling rope is kept constant even in the case of increased resistance, e.g. due to pipe sleeves.

3
Brittle materials

Just like the static method, dynamic bursting means a completely new pipe with a new service life of 80 - 100 years in the existing route. The GRUNDOCRACK is particularly suitable for the renewal of old pipes made of brittle materials such as vitrified clay, fibre cement or grey cast iron.

4
Practical Minis

In contrast to the static process, with dynamic bursting it is also possible to work with short pipes from shaft to shaft. This is possible with the GRUNDOCRACK mini-machines and the BURSTFIX for pulling in and securely clamping the short pipe segments.

5
Strong piece

The heavy-duty, solid casing of the GRUNDOCRACK is made in one piece from a forged piece, has neither welded seams nor screwed connections and is chrome-plated inside and out. The precise deep-hole drilling ensures direct force transmission from the piston to the head.

PERFORMANCE DATA

TYPE	PCG130	PCG180	PCG200	PCG260	PCG350
Machine- Ø	130 mm	180 mm	208 mm	280 mm	380 mm
Length (mm)	1.460 mm	1.700 mm	2.100 mm	2.290 mm	2.730 mm
Weight (kg)	95 kg	230 kg	395 kg	615 kg	1.180 kg
Expander- Ø (mm)	280 mm	392 mm	450 mm	560 mm	630 mm
New pipe-outer- Ø (mm)	225 mm	315 mm	355 mm	450 mm	560 mm
No. of strokes	320 min^{-1}	280 min^{-1}	290 min^{-1}	310 min^{-1}	220 min^{-1}
Air consumption (m^3/min)	2,7 m^3/min	4,5 m^3/min	6,5 m^3/min	12 m^3/min	20 m^3/min
With cutter head	x	x			
With pulling eye		x	x	x	x

All data without guarantee

GRUNDOCRACK in detail. More at

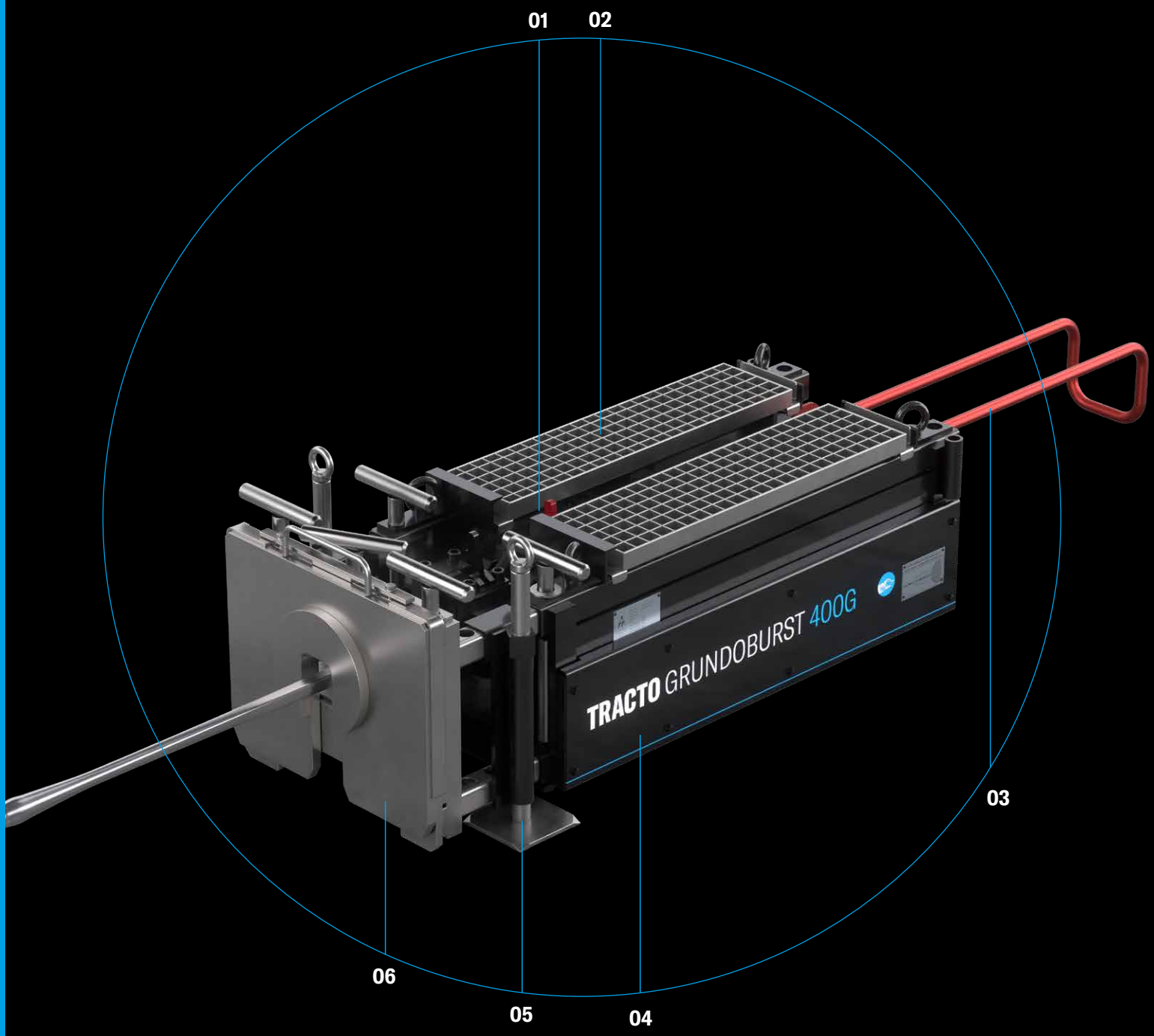
TRACTO.COM/
GRUNDOCRACK

DOUBLE RECORD

Dynamic pipe renewal over 180 m in one piece

Project:	In Wellington, the capital of New Zealand, a section of a 152 mm vitrified clay sewer in Adelaide Road had to be renewed. Under the busy residential and commercial street, the new 160 mm OD PE-HD pipe was pulled in one piece using the dynamic bursting method with only one intermediate pit - in a record-breaking 3 hours.
Client:	Wellington Water
Execution:	GP Friel Ltd
In use:	GRUNDOCRACK PCG 130
Duration:	3 hours for pulling in the pipe

GRUNDOBURST
STATIC PIPE BURSTING SYSTEMS
THE RENOVATORS



APPLICATIONS

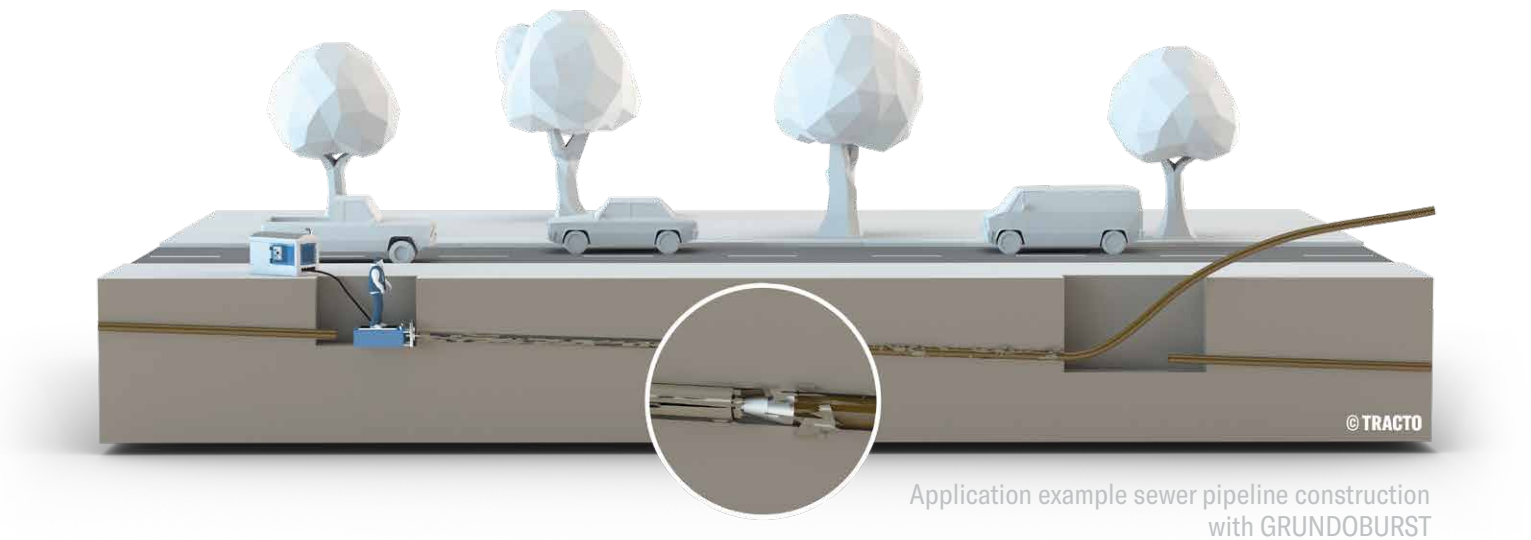
01 Two latch fingers prevent the rods from slipping back
02 Steps for safe standing
03 Safety bracket in the burst rod exit area
04 Very simple, robust frame design
05 Height adjustment via threaded rods
06 Integrated telescopic extension frame

GRUNDOBURST 800G

GRUNDOBURST STATIC PIPE BURSTING SYSTEMS - The bursting method is a globally established method for the trenchless renewal of damaged pipelines. In this process, the old pipe is replaced with a new pipe of the same or larger diameter in the existing route using the hydraulically driven GRUNDOBURST systems. With the static bursting method, work can be carried out horizontally in both directions from a machine starting pit.

The powerful and robust GRUNDOBURST burst rigs are perfectly suited for the renewal of pipes up to Ø 1,200 mm with circular or egg-shaped profiles. To do this, the carriage first pushes the bursting rod through the old pipe. After the cutting tool and the new pipe have been connected, the retraction begins. The specially developed QuickLock burst rod is not screwed on, but is quickly and effectively latched in place, providing thrust and tensile strength. This simplifies handling on the construction site considerably and even makes it possible to negotiate slight bends.

In addition to complete renewal, the versatile GRUNDOBURST systems with specific accessories can also be used for the partial repair and renovation of pipes.



Application example sewer pipeline construction with GRUNDOBURST

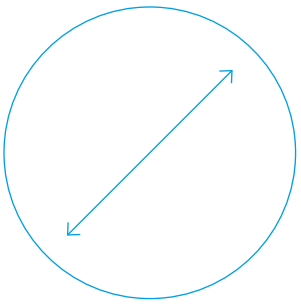
FACTS

INSTALLATION METHOD

STATIC

DYNAMIC

NEW PIPE DIAMETER



UP TO 1,200 MM Ø

MAIN AREAS OF APPLICATION

RENEWAL OF PRESSURE LINES

RENEWAL OF GRAVITY LINES

SONDEREINSATZBEREICHE

REHABILITATION

REPAIR

IN FIVE SENTENCES

1
Sustainable renewal

Static pipe bursting means a completely new pipe with a service life of 80 - 100 years. With GRUNDOBURST, damaged sewage and supply pipes can be renewed in the existing bore path for almost all types of damage using almost all materials. No subsequent costs due to soil settlement, groundwater interference and road damage after pipe bursting.

2
Powerful optimisers

Five powerful models with pulling forces from 400 to 2,500 kN allow pipe renewal up to Ø 1,200 mm from a shaft or pit. By inserting new pipes with smaller or larger diameters, even the pipeline capacity can be adjusted in the course of the renewal.

3
Perfect connection

The QuickLock bursting rods, made from one piece, are really tough, insensitive to dirt and can be used much longer than screwed rods. Thanks to the quick-lock coupling, screwing is no longer necessary and removal/insertion is faster. The connection is absolutely tension- and shear-resistant and even curve-compatible.

4
Flexible all-rounders

5 in 1: In addition to the classic bursting method (new pipe Ø equal or greater), the GRUNDOBURST systems can also be used for the partial repair and rehabilitation of pipes. Matching accessories allow long and short pipe relining, calibre bursting, tight-in-pipe and the reduction method.

5
Controlled forces

Because media and product pipes must not be overstressed when being drawn in, the acting tensile forces must be checked and recorded. This is done safely and reliably by the GRUNDOLOG tensile force measuring devices for the performance classes 150 kN, 400 kN, 1,250 kN and 2,500 kN.

PERFORMANCE DATA

TYPE	400G	400S	800G
Dimensions of rig L x W x H	1.420 x 560 x 520 mm	600 x 490 x 340 mm	1.700 x 720 x 670 mm
Weight of rig	560 kg	200 kg	1.450 kg
Pulling force at 250 bar	400 kN	400 kN	769 kN
Old pipe Ø	ND 50 - ND 250 mm	ND 50 - ND 250 mm	ND 80 - ND 400 mm
New pipe Ø*	up to OD 280 mm	up to OD 280 mm	up to OD 400 mm
For pipe materials	PE, PVC, stoneware, grey cast iron, GFRP, steel	PE, PVC, stoneware, grey cast iron, GFRP, steel	PE, PVC, stoneware, grey cast iron, GFRP, steel
Bursting rod-Ø	54 mm	54 mm	75 mm
Bursting rod Weight	7,5 kg	5 kg	13 kg

TYPE	1250G	1900G	2500G
Dimensions of rig L x B x H	2.300 x 1.100 x 875 mm	2.850 x 1.150 x 1.000 mm	2.950 x 1.600 x 1.500 mm
Weight of rig	3.120 kg	3.320 kg	4.100 kg
Pulling force at 250 bar	1.272 kN	1.900 kN	2.550 kN
Old pipe Ø	ND 150 - ND 600 mm	ND 250 - ND 800 mm	ND 300 - ND 1.200 mm
New pipe Ø*	up to OD 630 mm	up to OD 900 mm	up to OD 1.200 mm
For pipe materials	PE, PVC, stoneware, grey cast iron, GFRP, steel	PE, PVC, stoneware, grey cast iron, GFRP, steel	PE, PVC, stoneware, grey cast iron, GFRP, steel
Bursting rod-Ø	100 mm	120 mm	140 mm
Bursting rod Weight	85 kg	165 kg	210 kg

*dependent on soil | All data without guarantee

GRUNDOBURST in detail. More at

TRACTO.COM/ GRUNDOBURST

LARGE DIMENSIONS, STEEP HILL

Renewal of two water pipelines with capacity upsizing in the Swiss mountains

Project: Half of the drinking water for the inhabitants of Zug consists of pure groundwater, which is extracted from the source areas of the rugged Loren Valley. When two water pipes to one of the so-called 'well pits' had to be renewed, the GRUNDOBURST proved that the bursting process works safely even under extreme conditions. Despite the more than adverse conditions in the steep, rocky terrain, the two ND 100 and ND 200 pipelines could be renewed underground gently, quickly and cost-efficiently.

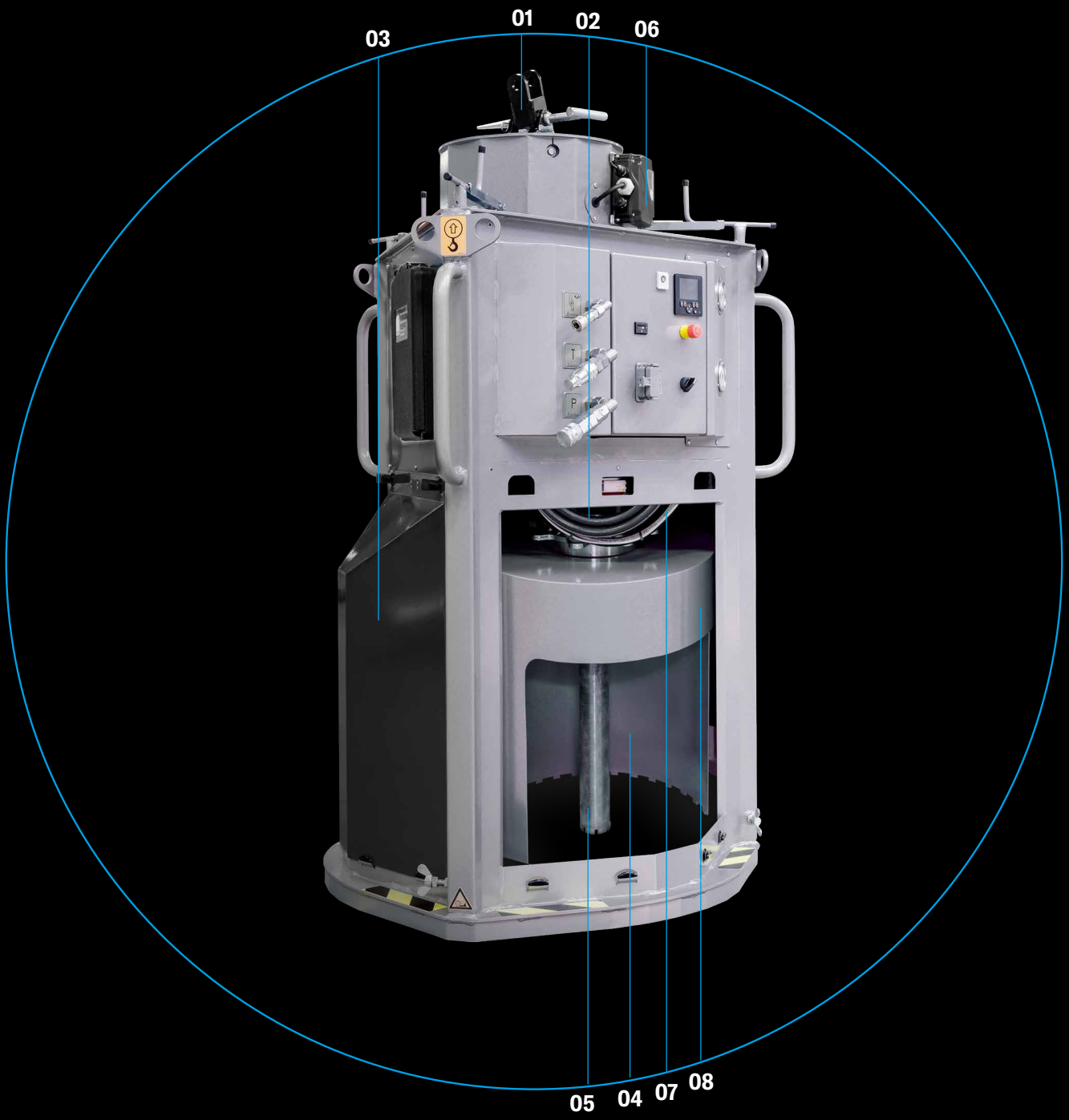
Client: WWZ Energie AG

Design: TPS Trenchless Piping Systems AG

In use: GRUNDOBURST 800G

Duration: 1.5 days

GRUNDOCORE CORE DRILL UNITS FOR THE PERFECT CONSTRUCTION PIT



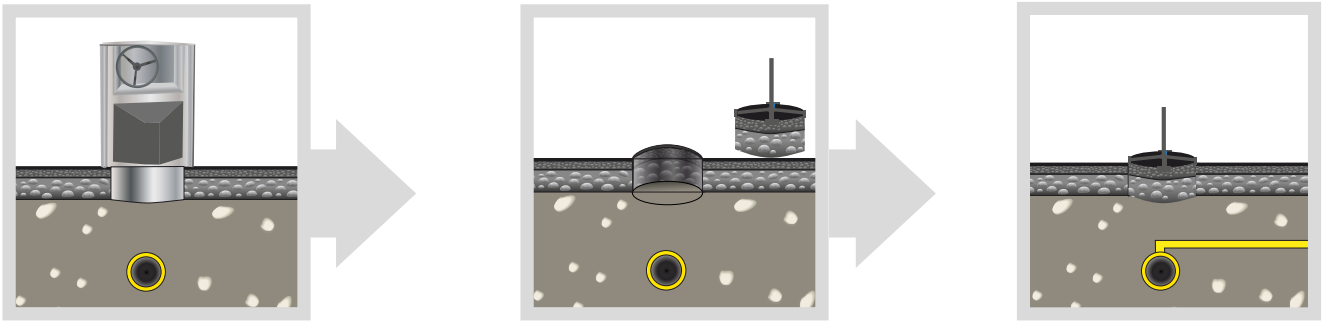
APPLICATIONS

01 Speed adjustment via proportional valve
02 Rotational drive with two concentric drive spindles
03 Easy to dismantle panelling sheets
04 Deep cutting down to 600 mm
05 Integrated reception for second (smaller) crowned bore head
06 Wireless remote control
07 Non-wearing swivel
08 Stepless adjustment of rotational speed and thrust force

GRUNDOCORE CORE DRILLS - Circular excavations allow fast and particularly gentle access to the underground infrastructure without classic excavation work . The main advantages of the circular excavation are the complete absence of stress on the surface and the long-term stability after resealing.

To create these round excavations, a ring-shaped cut is made in the asphalt, concrete or reinforced concrete surface using GRUNDOCORE core drills. The core is cleanly cut out and later reinserted with an exact fit, so the surface is sustainably restored without any follow-up costs..

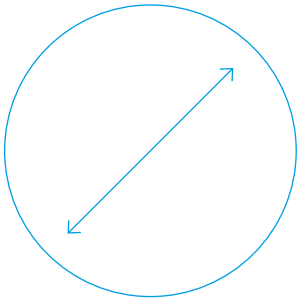
Four powerful models of the GRUNDOCORE series can be used to create minimally invasive keyholes and even walk-in round excavations. In addition, the core drills are part of a concept solution with a special drilling rig for the particularly gentle trenchless relocation and renewal of water, gas, electricity and data lines through a keyhole.



Application example Keyhole method with GRUNDOCORE

FACTS

DIAMETER BORE CORE



650 - 2.000 Ø

MAIN AREAS OF APPLICATION

- KEYHOLES
- WALK-IN STARTING PITS
- SERVICE & REPAIR PITS
- START/ TARGET PIT NODIG

SPECIAL FEATURES

- VOLTAGE-FREE
- DRILL CORE CAN BE RE-USED
- ASPHALT, CONCRETE, REINFORCED CONCRETE
- MINIMALLY INVASIVE

IN FIVE SENTENCES

1
Friction-less

Resealed construction pits are subject to high tension, e.g. when driving over them. With round construction pits, the surface tension is distributed homogeneously, being up to four times lower than with square construction pits. When reinstating circular cut asphalt cores, the surface is sustainably restored - without any follow-up costs.

2
Crowned heads

The crowned bore heads of the GRUNDOCORE units can cope with even the hardest road surfaces. Whether asphalt, concrete or reinforced concrete - with the high-carbon steel bore heads, the ring-shaped cut in the surface up to a depth of 650 mm is carried out precisely and the core is cut out cleanly.

3
Easy-cutting models

All GRUNDOCORE models offer maximum cutting performance combined with convenient features. Depending on the model, they have, for example, height-adjustable feet, wireless remote control, integrated holder for a second smaller core, or automatic core guide.

4
Conceptual artists

The GRUNDOCORE models 650/450, 650/600 and TSC650/600 are part of the concept solution for the trenchless installation and renewal of all types of house connections through the keyhole with the GRUNDOPIT KS50, which was specially developed for this utterly minimally invasive installation method.

5
Strong pit worker

With the GRUNDOCORE 1500/650, circular walk-in construction pits up to 1,500 mm Ø, which are very economical and productive especially in sewer rehabilitation, can be produced Thanks to its compact frame design, the 1500/650 is easy to transport, despite its large crowned bore head unit.

PERFORMANCE DATA

TYPE	650/450	650/600	TSC650/600	1500/650
Height	1.360 mm	1.780 mm	1.780 mm	1.900 mm
Core drill unit-Ø	1.060 mm	1.220 mm	1.220 mm	2.040 mm
Max. crowned bore head diameter	650 mm	650 mm	650 mm	1.500 mm
Weight without crowned bore head approx.	300 kg	355 kg	435 kg	995 kg
Weight with crowned bore head max.	360 kg	420 kg	500 kg	1.250 kg
Max. drilling depth	450 mm	600 mm	600 mm	650 mm
Max. operating pressure	200 bar	200 bar	150 bar	225 bar
Mal oil required	25 l/min	35 l/min	55 l/min	55 l/min
Max. rotational speed (outer/inner crowned head)	200 / - rpm	200 rpm	160 / 1.280 rpm	60 / - rpm
Torque	360 Nm	470 Nm	560 Nm	2.500 Nm

All data without guarantee

GRUNDOCORE in detail. More at

TRACTO.COM/ GRUNDOCORE

IN SERIES THROUGH THE KEYHOLE

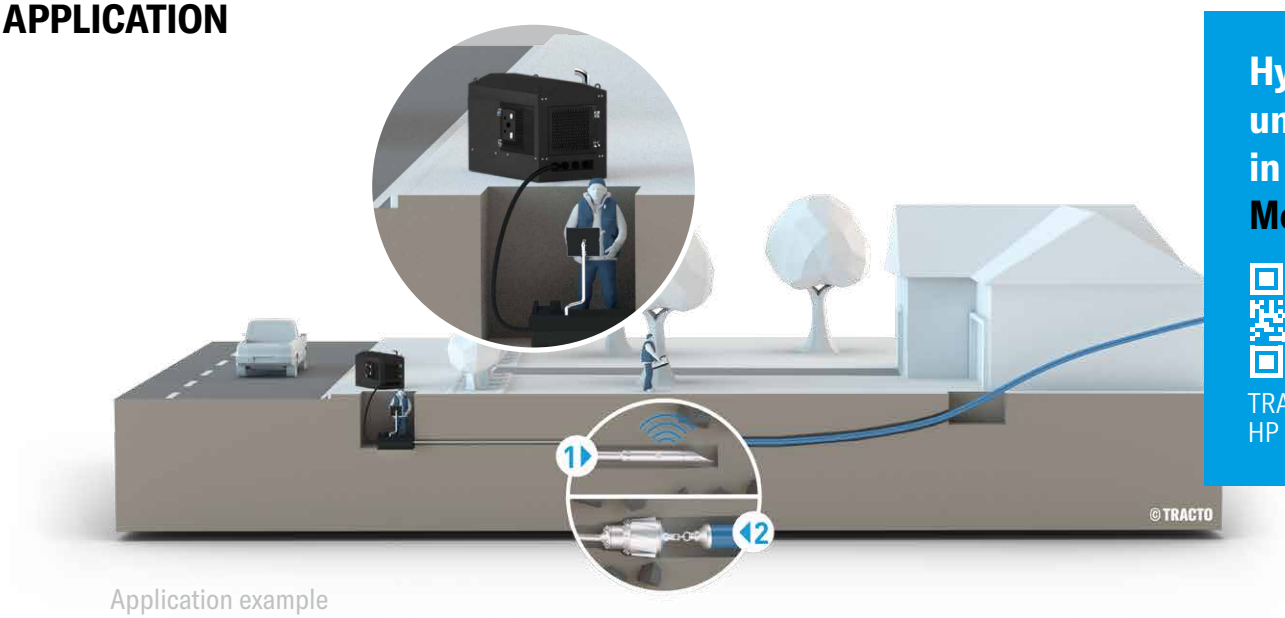
Serial repair of house connection slide valves through the keyhole

Project:	In Wilhelmstal, 25 valve tops of house connection slides had to be replaced. The cheapest and quickest solution with maximum protection of the road surface was the replacement by keyholes Ø 65 cm. For this purpose, the asphalt surface was cut into a circle with a core drill and the soil was drained out up to the main pipe. The replacement of the gate valves was carried out from the surface with a time delay. Afterwards, the keyholes were backfilled and the previously drilled asphalt cores were reinstalled in the correct height and position.
Client:	FWG Zweckverband Wasserversorgung
Execution:	Anton Eidloth GmbH
In use:	GRUNDOCORE 650
Duration:	45 min. for separating and draining per keyhole

HYDRAULIC UNITS
FULL POWER SUPPLY

Efficient and reliable drive technology is essential to be able to use our hydraulically powered NODIG systems with maximum energy. Our hydraulic units are precisely designed for this power requirement and provide the required external hydraulic energy on target without power losses. Precisely adjusted pre-settings for the GRUNDODRILL and GRUNDOPIT mini drilling rigs, the GRUNDOBURST static pipe bursting systems, the GRUNDOBORE auger boring system and all TRACTO mixing units enable fast work.

APPLICATION



Application example
house connection water pipe

Hydraulic units in detail. More at

TRACTO.COM/HP

VARIATIONS




TYPE	HP19	HP28 / HP37	HP55	HP150
Drive capacity	19 kW	37 kW	55 kW	149 kW
Maximum oil flow rate	90 l/min	160 l/min	200 l/min	1425 l/min
GRUNDOPIT	PS40	PS60	PS60	PS60
GRUNDOBORE	-	200S (HP28)	200S	200S
GRUNDOBURST	400S, 400G	400S, 400G, 800G (HP37)	400S, 400G	400S, 400G

MIXING SYSTEMS
THE OPTIMUM DRILLING FLUID

A first-class drilling fluid technology for the preparation and application of drilling fluid in the HDD process is a major component of successful drilling operations. TRACTO's mixing systems form a perfect unit with the bore rig and the drilling tools for efficient work - even in difficult soils. Powerful pumps and large tanks guarantee a high flow rate for the optimal clearing of the bore path with a drilling fluid perfectly adapted to the specific soil conditions.

TRUCK SET-UP

Set-up example with MA07

Mixing units in detail. More at

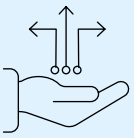
TRACTO.COM/MA

VARIATIONS

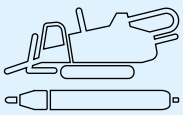
TYPE	RINSING UNIT FU1	MIXING UNIT MA09	MIXING UNIT MA010-D	MIXING UNIT MA07
Tank volume mixing tank	300 l	1,100 l	4,000 l	2 x 4,000 l
Maximum flow rate High pressure pump	14,6 l/min	40 l/min	1,300 l/min	1,500 l/min
GRUNDOPIT	PS40, PS60	PS40, PS60	-	-
GRUNDODRILL	-	-	15XP / 15XPT, 18N / 18ACS, 28Nplus, JCS130 / ACS130	15XP / 15XPT, 18N / 18ACS, 28Nplus, JCS130 / ACS130

FULL SERVICE FOR TRENCHLESS TECHNOLOGY

Whether its before, during or after the purchase, whether in person or online – we are always at your side with advice and support. Our wide-ranged service is specially tailored to the requirements of trenchless pipe installations, so you can concentrate fully on your core business.



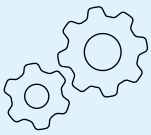
Digital Solutions
Our website offers you the whole world of trenchless technology in digital form. Find out more about our company, our products and their applications. Discover the digital tools for the HDD drilling technology and many other intelligent solutions. Always stay up to date by using the links to our social media channels. Or you can order machines, accessories and spare parts in our eSHOP – easy and conveniently via PC, smartphone or tablet.



Nodig Product Specialists
You can truly rely on our product specialists for all technical questions regarding the function and application of our steerable and non-steerable NODIG-systems. With comprehensive knowledge in each of their special fields, you can be sure they will find the best solution for your trenchless projects and advise you competently on setting up your jobsite.

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

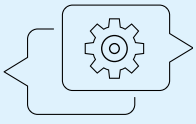
Training
Qualified training enables you to apply trenchless technology even more effectively and profitably. Our wide range of training courses for machine operators, construction professionals as well as planners and clients cover all aspects of NODIG technology, including special topics. Certified trainers also instruct you, in theory and practice according to your individual requirements, either at one of our numerous company locations, or directly on your own premises or online, independent of time and place.



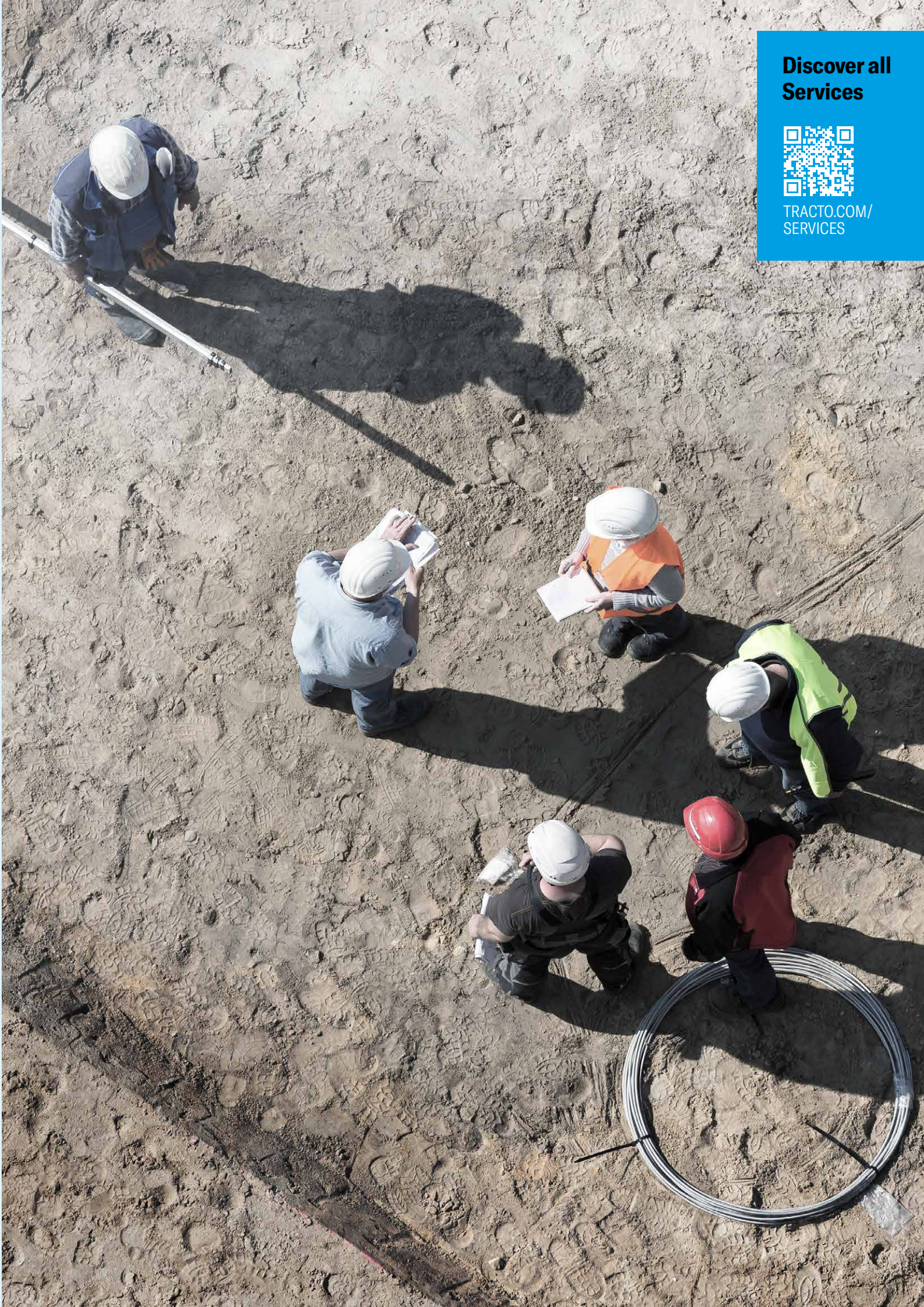
Specialised Civil Engineering Service (Application Technology)
The specialised civil engineering service for application technology provides support for all your trenchless construction sites.
Our experts demonstrate the steerable and non-steerable NODIG technology live in practical use, show your drilling teams how to use it or actively assist with special projects.

Geoservice
Precise knowledge of the soil is the key to successful trenchless projects. Our Geoservice team provides you with this professional knowledge. Our expertise puts you in a position to master every type of soil. Based on geoscientific maps and existing construction files, we supply information on the soil, which will help you with calculations or supplements.

Used Equipment
If you want to sell a used machine at an attractive price or are looking for the right equipment for your tasks, our full service for used NODIG machines will take the workload off your hands – from appraisal and price determination to professional repair and certification, through to achieving the best price for you via our used machine website with access to one of the world's largest construction machinery platforms.



After Sales
Via our worldwide service network we are always there for you, even after the purchase. A total of five TRACTO plants and seven customer centres in Germany, as well as our worldwide sister companies and sales partners guarantee fast supply of spare parts and immediate availability. Our competent service staff offer fast assistance, to ensure you don't lose any time.



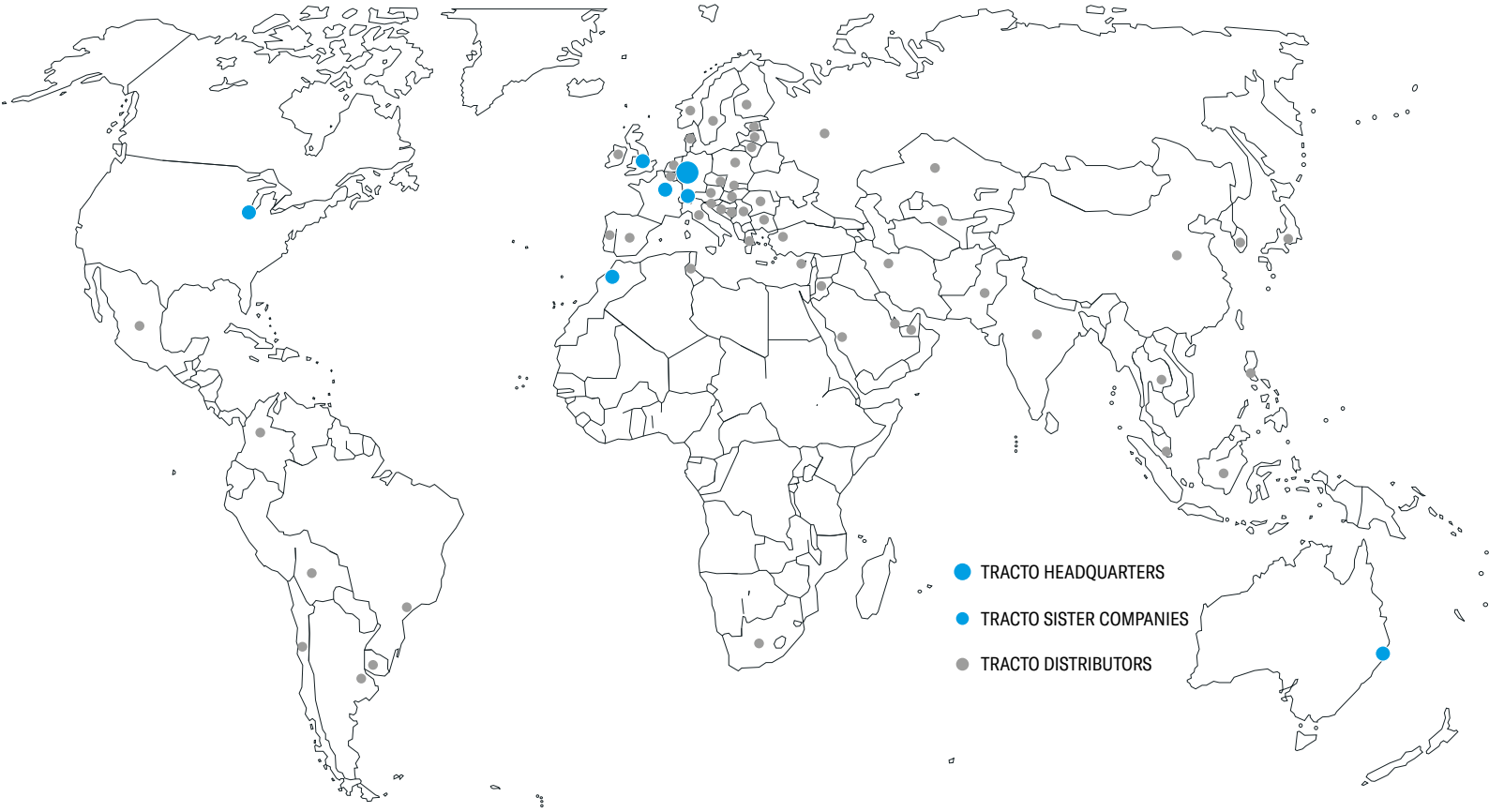
Discover all Services

TRACTO.COM/
SERVICES

TRACTO-TECHNIK GMBH & CO. KG HEADQUARTERS

PAUL-SCHMIDT-STRASSE 2
57368 LENNESTADT, GERMANY
T +49 2723 808-0
F +49 2723 808-180
INFO@TRACTO.COM

TRACTO.COM



SWITZERLAND
TRACTO-TECHNIK SCHWEIZ AG
INDUSTRIESTRASSE 4
8360 ESCHLIKON TG, SCHWEIZ
T +41 79 8203897
CH@TRACTO.COM
TRACTO.COM/CH-FR

UNITED KINGDOM
TRACTO-TECHNIK UK LTD
10 WINDSOR ROAD
BEDFORD MK 42 9SU
T +44 1234 342566
F +44 1234 352184
INFO@TRACTO-TECHNIK.CO.UK
TRACTO.COM/UK

FRANCE
TRACTO-TECHNIK FRANCE S.A.R.L.
1/3 RUE DE LA PRAIRIE
F-77700 BAILLY ROMAINVILLIERS
T +33 1 60 42 49 40
F +33 1 60 42 49 43
FR@TRACTO.COM
TRACTO.COM/FR

USA
TT TECHNOLOGIES INC.
2020 EAST NEW YORK STREET
AURORA, IL. 60502
T +1 630 851 8200
F +1 630 851 8299
INFO@TTTECHNOLOGIES.COM
TTTECHNOLOGIES.COM

AUSTRALIA
TRACTO-TECHNIK AUSTRALIA PTY LTD.
10 ALICIAJAY CIRCUIT
LUSCOMBE, QLD 4207
T +61 7 3420 5455
AU@TRACTO.COM
TRACTO.COM/AU

MOROCCO
TRACTO-TECHNIK AFRIQUE S.A.R.L.
ROUTE DE TAMESNA 4022
POSTE 2044, 12220 TAMESNA
T +212 5 37 40 13 63 / 64
F +212 5 37 40 13 65
INFO@TRACTO-TECHNIK.MA
TRACTO.COM/MA

TRACTO
ADVANCED TRENCHLESS TECHNOLOGY

TRACTO PARTNER:

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