

TRACTO

GRUNDORAM &
GRUNDOCRACK
THE DRIVING
FORCE

All you need to know about
GRUNDORAM & GRUNDOCRACK

TRACTO.COM/PRODUCTS



ADVANCED TRENCHLESS TECHNOLOGY

GRUNDORAM HARD AS NAILS

The pneumatically driven GRUNDORAM horizontal ramming machines can develop impact energies up to 40.000 J. Due to the galvanised one-piece machine housing and the elaborately tempered piston, the machine technology is especially robust, reliable and durable. The GRUNDORAM horizontal rammers can be operated in all kinds of soil with the exception of muddy areas, swamps and compact non-displaceable soils, for numerous types of applications.

The most common GRUNDORAM application is the horizontal installation of steel pipes up to ND 4000 mm with dynamic impact and a small displacement volume. Steel pipes are used as media pipes, for example within the domain of pipeline construction or as

casing pipes for bundling supply and waste disposal lines but also for building subways, smaller culverts and pipe roofs for a tunnel construction.

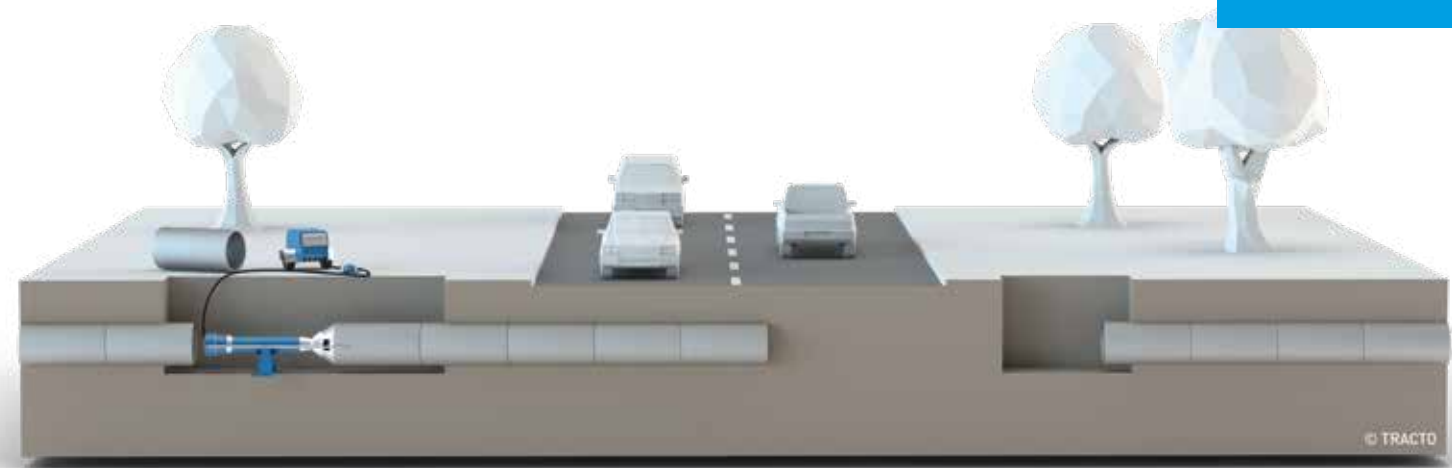
With the appropriate accessories, the GRUNDORAM horizontal rammers can also be used for vertical applications, to support HDD drilling (HDD Assist) and for dynamic pipe renewals.

GRUNDORAM
Useful
application
videos at



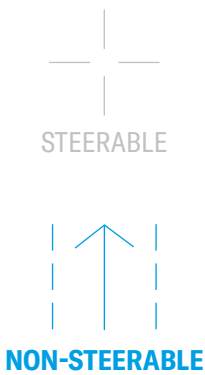
TRACTO.COM/
APPLICATIONS

APPLICATION

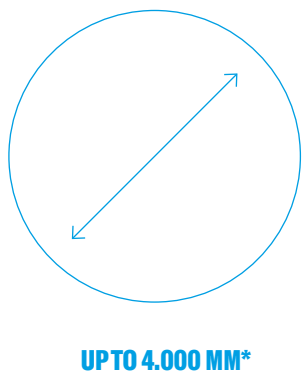


Dynamic pipe installation

TYPE OF DRILLING

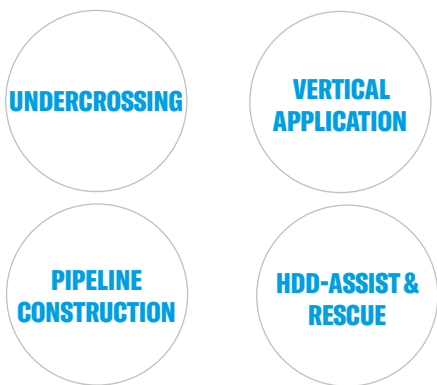


PIPE DIAMETER

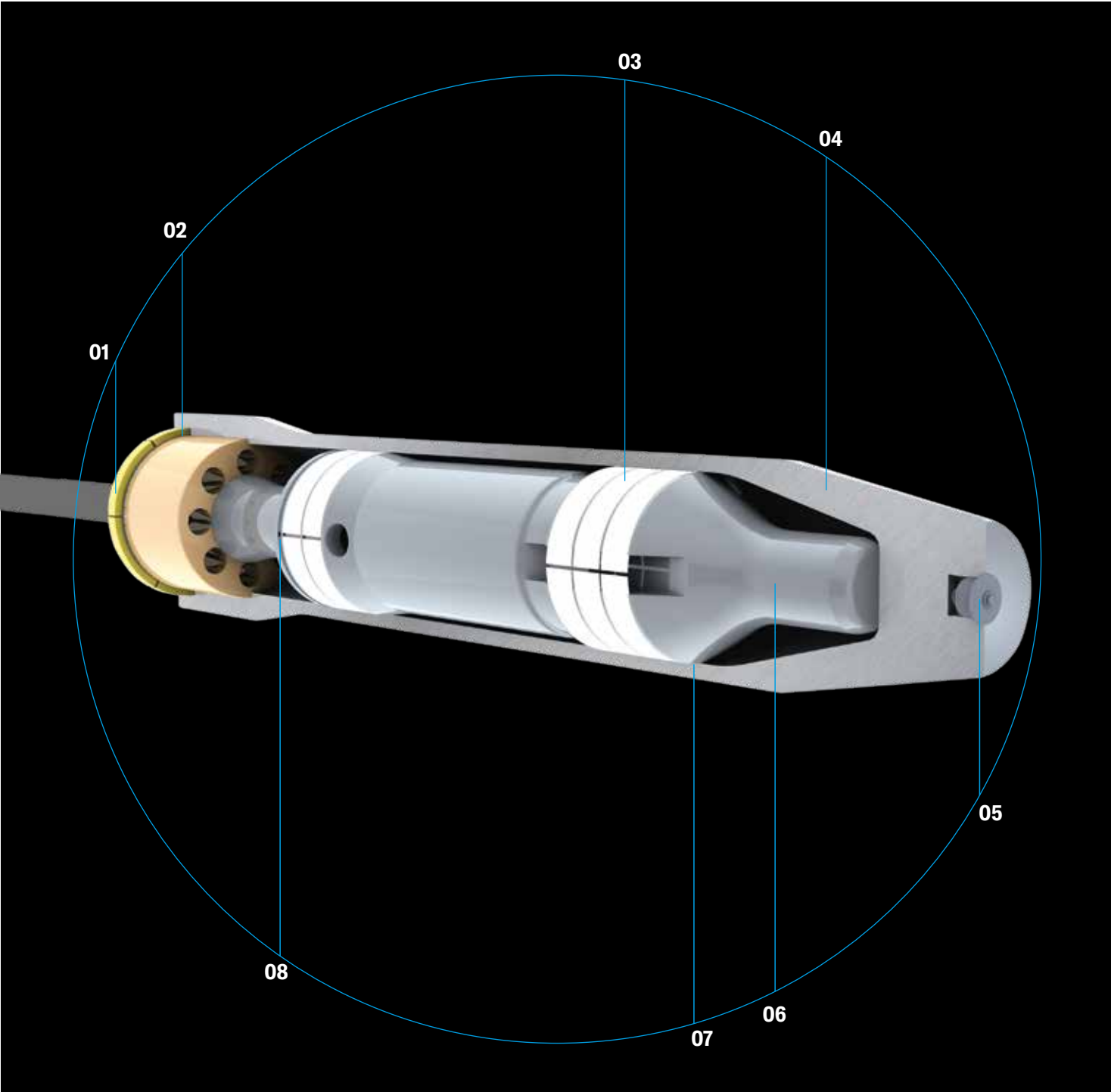


* depending on soil

DYNAMIC PIPE INSTALLATION WITH RAMMING METHOD



OVERVIEW



01 Segment rings for positive locking of the control unit

02 Permanently elastic mounted control stud – material friendly under high loads

03 Piston slide tapes prevent friction between piston and casing, reducing wear and tear

04 Solid, one-piece casing – highly resilient without seams or screw connections

05 Thread for screwing in a towing eye for pipe sanitation tasks

06 Solid, tempered piston for increased strength and longer service life

07 Inner casing chrome-plated to reduce wear for a long-lasting high performance

08 Piston seal rings reduce air consumption and therefore increase performance and efficiency

Wide range of accessories available

GRUNDORAM

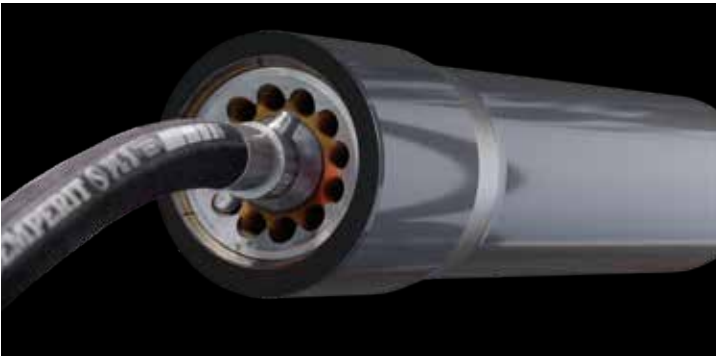
ALL HIGHLIGHTS AT A GLANCE

GRUNDORAM
Always
completely
tight



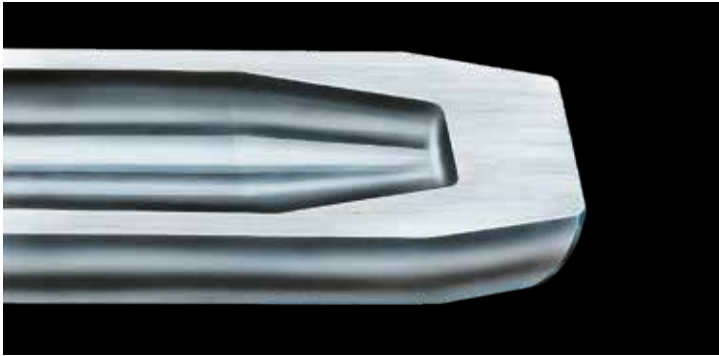
No material wear

The solid piston is mounted on several slide tapes which prevent material-wearing friction of metal on metal. Seal rings minimise air consumption, increase the performance level and therefore efficiency – therefore providing enormous thrust power.



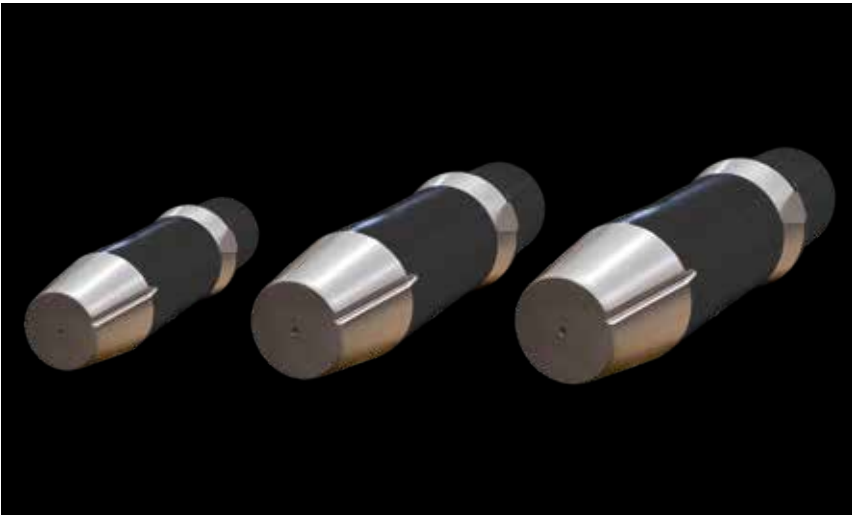
One-piece

The solid casing is produced in one-piece from a forging and galvanically treated. The precise deep-hole boring ensures direct force transmission from the piston to the casing head.



GRUNDORAM Mini-Machines

The short and powerful mini machines are ideal for propulsion in the pipe and therefore optimal when working in tight and inaccessible jobsites.



Dynamic steel pipe installation

The dynamic steel pipe installation method with GRUNDORAM horizontal rammers enables the economic installation of casing or product pipes up to 4000 mm diameter in soil classes 1-5 (partly even soil class 6 – easily soluble rock) underneath roads, railway tracks and rivers over lengths up to 100 m.

Target precision is achieved because the dynamic impact punches through the ground, destroying obstacles so they don't need to be displaced in one piece and pushed ahead. The soil is collected inside the open steel pipe, which is usually emptied using compressed air and/or water. The particular advantage of the TT-rammers is the fact that press abutments are not required, which significantly reduces set-up times.



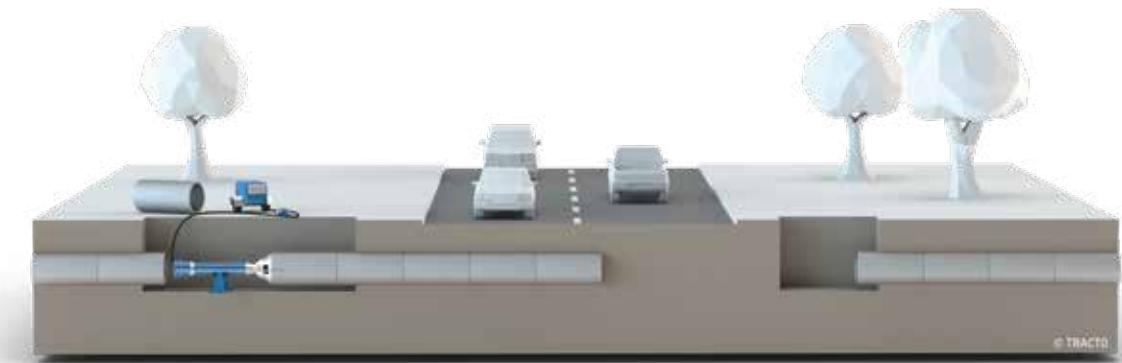
DYNAMIC STEEL PIPE INSTALLATION

NUMEROUS POSSIBILITIES – ONE MACHINE

The piston strikes inside the head of the one-piece housing of the rammer. Passing through the plug-on cone, the generated impact energy is transferred directly to the steel pipe casing, which is then driven steadily through the ground.

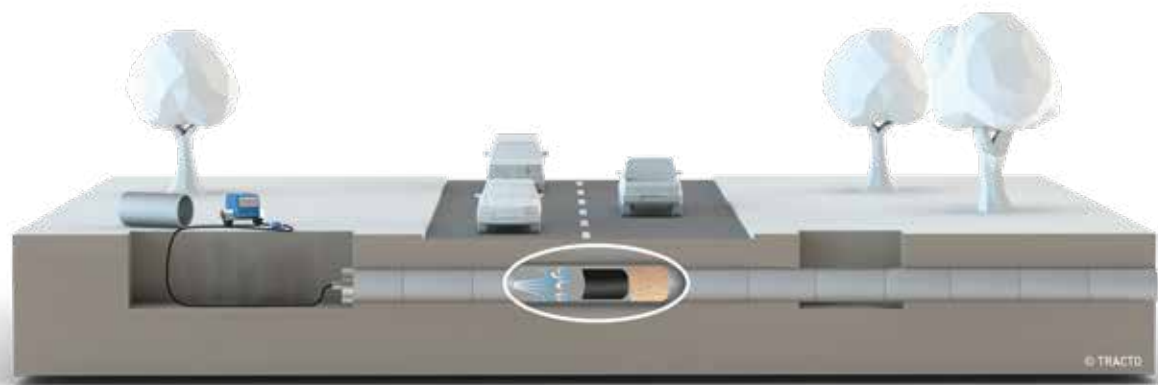
Pipe installation

The rammer is firmly connected to the pipe to be installed using an attachable cone before being aligned axially behind the pipe with the aid of the lifting cushion. Thanks to the soil removal adapter or cone, the soil inside the pipe can partially escape, while the pipe is being driven forward.



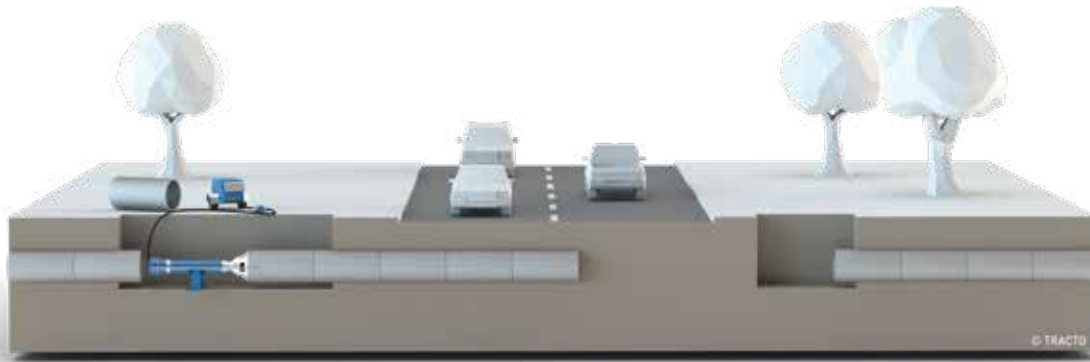
Soil removal

The soil, which is taken up by the open pipe during the ramming process, is finally expelled into the target pit using compressed air and/or water. Alternatively, the soil can either be drilled out, flushed out or, dredged out.



Undercrossings

When ramming with GRUNDORAM steel pipes up to Ø 4.000 mm are installed under roads, railway tracks, buildings and rivers over lengths up to 80 m.



HDD-Assist

The horizontal rammers are perfectly suitable to successfully complete complicated HDD bores.



- **Bores inside protection pipe**

In soils which are impossible to bore through, a steel pipe is rammed through the relevant soil layer, which gives protection for the horizontal drilling operation to commence.

- **Pull-Back Assist**

When pulling in steel pipes for HDD, the GRUNDORAM can give dynamic support or release pipes if they become jammed.

The rammer is connected to the steel pipe at the rear to allow the application of impact energy, synchronised with the pulling speed.

- **HDD Rod retrieval**

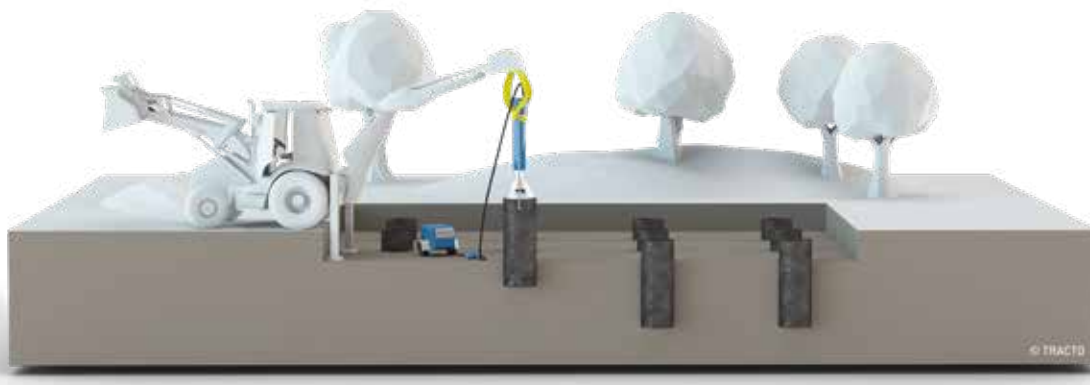
Pulling out jammed drill rods with the aid of an adapter and dynamic ramming force.

- **Rod retrieval**

Retrieving jammed product or casing pipes after the HDD operation.

Vertical Applications

When applied vertically, the pipe ramming technique can be used for numerous different job site situations.



- **Foundations and pile foundations**

e.g. for overhead signs, noise barriers, safeguarding buildings etc

- **Well construction**

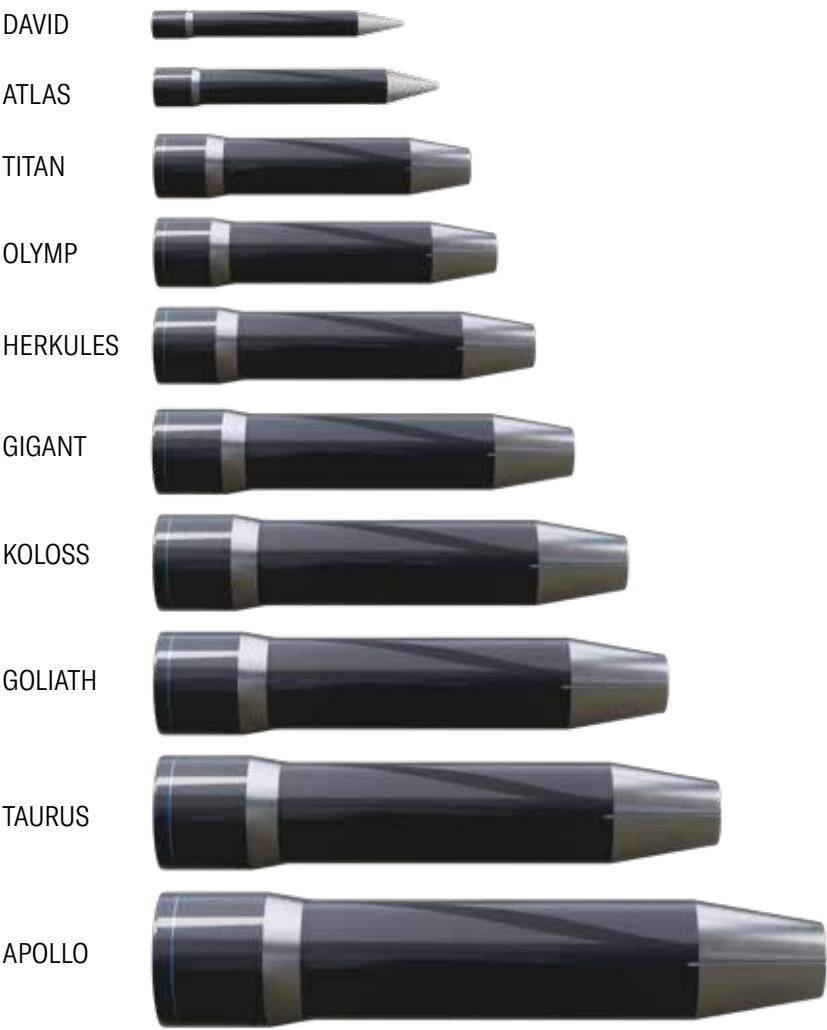
Vertical steel pipe driving to install wells. Emptying with round grippers

- **Ramming in sheet piles**

Steel sheet piles or double T-beams, e.g. for securing construction pits etc.

VARIATIONS

GRUNDORAM STANDARD-MACHINES



TECHNICAL DATA

GRUNDORAM-TYP	DAVID	ATLAS	TITAN	OLYMP	HERKULES	GIGANT	KOLOSS	GOLIATH	TAURUS	APOLLO
Machine-Ø	95 mm	130 mm	145 mm	180 mm	216 mm	270 mm	350 mm	460 mm	600 mm	800 mm
Ø rear cone	112 mm	145 mm	160 mm	195 mm	235 mm	300 mm	400 mm	510 mm	670 mm	900 mm
Length	1.490 mm	1.453 mm	1.545 mm	1.690 mm	1.913 mm	2.010 mm	2.341 mm	2.852 mm	3.645 mm	4.400 mm
Weight	59 kg	95 kg	137 kg	230 kg	368 kg	615 kg	1.180 kg	2.465 kg	4.800 kg	11.500 kg
Air consumption	1,2 m³/min	2,7 m³/min	4,0 m³/min	4,5 m³/min	6,5 m³/min	12,0 m³/min	20,0 m³/min	35,0 m³/min	50,0 m³/min	100 m³/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	180 min ⁻¹	180 min ⁻¹	180 min ⁻¹
Impact energy	230 J	420 J	800 J	890 J	1.440 J	2.860 J	6.820 J	11.600 J	18.600 J	40.500 J
From pipe size	50 ND	50 ND	100 ND	100 ND	120 ND	200 ND	280 ND	380 ND	380 ND	600 ND

VARIATIONS

GRUNDORAM MINI-MACHINES



- No abutment required – short set-up times
- One-piece, deep-hole drilled housing - high creep rupture strength and optimum energy transmission with maximum impact force and enormous thrust power
- Segmental machine lock with elastically suspended control – safe, positive locking design
- Service-friendly design with only one-sided machine closure
- Mini machines with shortened overall length for use in confined spaces, as well as reverse gear for simple and ergonomic loosening of the ramming accessory.

TECHNICAL DATA

GRUNDORAM-TYP	MINI-ATLAS	MINI-OLYMP	MINI-GIGANT
Machine-Ø	125 mm	180 mm	270 mm
Ø rear cone	140 mm	230 mm	330 mm
Length	946 mm	1.080 mm	1.230 mm
Weight	60 kg	175 kg	460 kg
Air consumption	1,7 m³/min	3,5 m³/min	10,0 m³/min
No. of strokes	580 min ⁻¹	500 min ⁻¹	430 min ⁻¹
Impact energy	180 J	720 J	2.000 J
From pipe size	50 DN	100 DN	200 DN

GRUNDORAM FOR EVERY TASK

Accessories perfectly adapted to the ramming machine guarantee optimum progress in every type of soil. Robustness and durability of all parts are also guaranteed.

PLUG-ON CONES



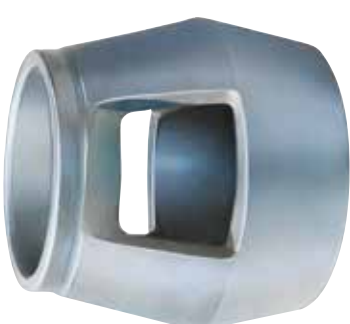
Using attachable taper-lock ram cones, the GRUNDORAM is firmly connected to the pipe to be installed.

IMPACT SEGMENTS



The multi-part impact segments prevent pipe end flare and improves the optimal induction of impact power.

SOIL REMOVAL ADAPTER



With a soil removal adapter or taper-lock ram cones, the soil inside the pipe can partially escape while the pipe is being driven forward.

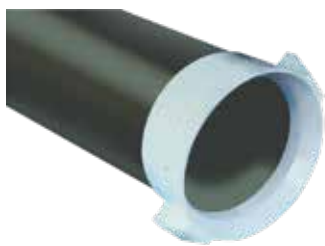


CUTTING SHOE



Cutting shoes reinforce the cross section of the front-end pipe, protect the insulation of the pipe and reduce coat friction, both inside and outside.

LUBRICATING CUTTING SHOES



Lubricating cutting shoes additionally lubricate the pipe, inside and outside, thus reducing friction and facilitating the pipe drive.

THE 7 L OIL LUBRICATOR



Is connected in between the compressor and the machine to enable lubrication of the internal piston.

STARTING CRADLE WITH LIFTING CUSHION



With the lifting cushion positioned inside the starting cradle, the heavy ramming machines can be lifted and lowered without effort. Available in 4 versions, all with adequate lifting force

Further accessories available upon request.

PRESSURE PLATE WITH RIGID FOAM PLUG



The pressure plate closes the end of the pipe, making it pressure resistant to enable pushing the soil core out. Depending on the type of soil, a foam plug may be necessary to seal the front.

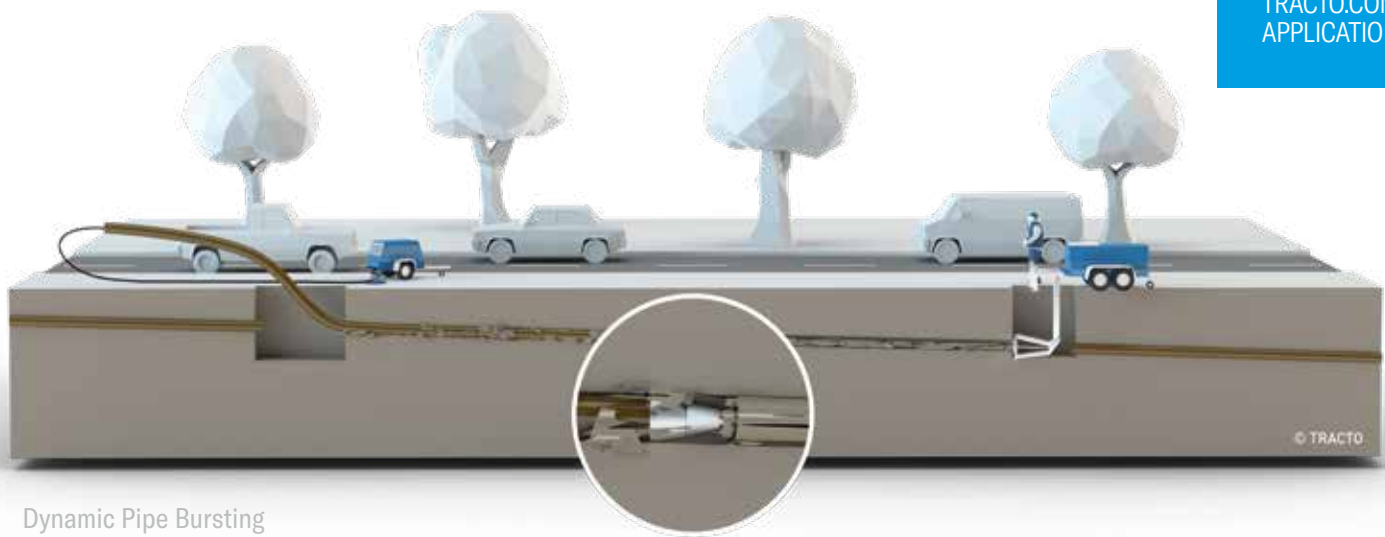
GRUNDOCRACK

DYNAMICALLY PRODUCTIVE

GRUNDOCRACK machines are basically modified horizontal ram-
mers equipped with a reverse gear. This allows the accessories to
be dismantled quickly and ergonomically and the machines to be
easily recovered even in confined spaces.

The GRUNDOCRACK, operated with compressed air, drives through
old pipes, shattering them and radially displacing the broken
fragments into the surrounding soil. The bore hole for the new pipe
is expanded at the same time. The pulling force of a winch supports
the pipe cracker, guaranteeing safe guidance through the defined
bore path. The GRUNDOCRACK machines are especially suitable
for the dynamic renewal of damaged pipes made of brittle material

APPLICATION



GRUNDOCRACK
Application-
Videos at

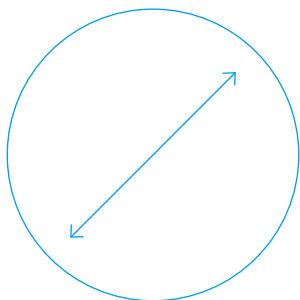


TRACTO.COM/
APPLICATIONS

BORE METHOD



NEW PIPE-OUTER DIAMETER



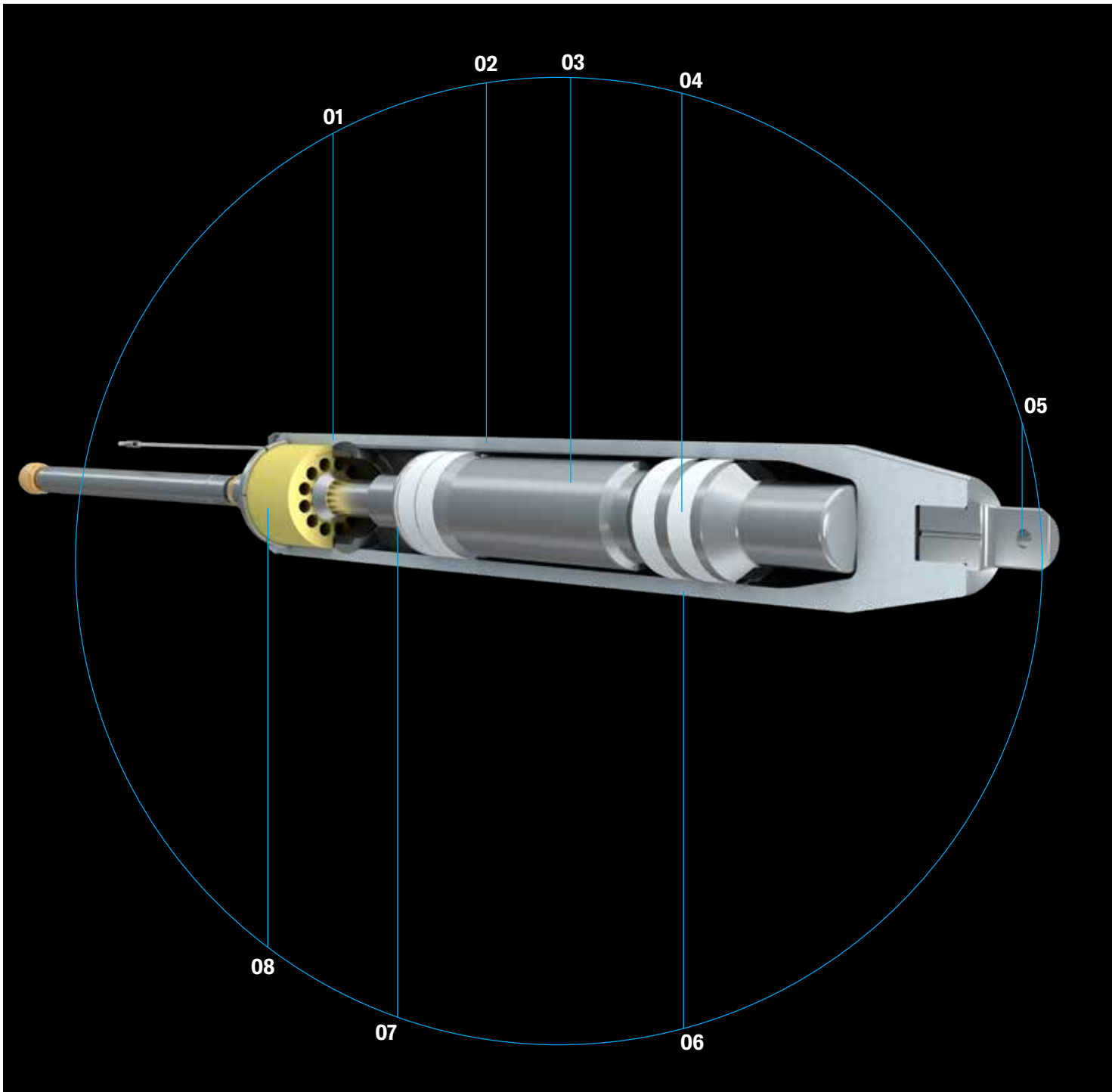
*depending on machine type

PIPE RENEWAL AND PIPE SANITATION



*with low cross-section reduction
and low annular gap

OVERVIEW



01 Inner and outer chrome-plated casing to increase the corro-
sion resistance and reduce wear and tear

02 Solid, one-piece casing – heavy-duty without welded seams
or screwed joints

03 Solid, hardened and tempered piston for increased strength
and longer service life

04 Piston slide tapes prevent friction between piston and casing
and reduce wear and tear

05 Pulling eye for cable connection for a target-precise guidance
of the cracker

06 Smooth machine casing – easy retrieval through the new pipe
in confined working conditions

07 Piston seals minimise the air consumption and therefore
increase the performance and efficiency

08 Elastically mounted control stud – gentle on material

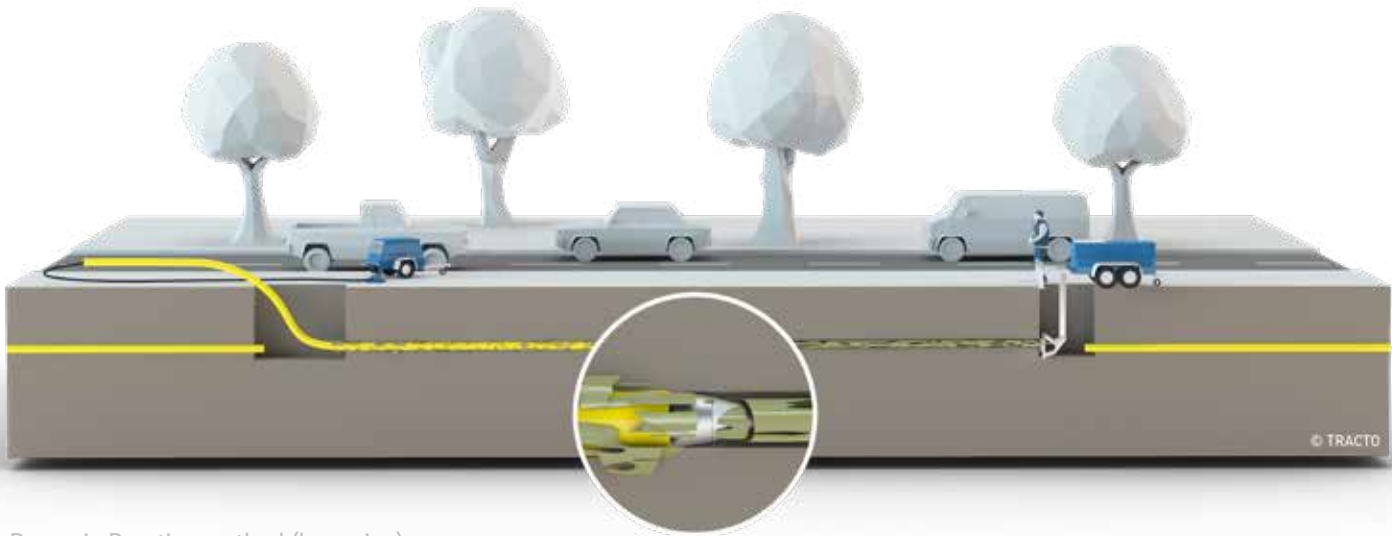
GRUNDOCRACK

DYNAMIC PIPE RENEWAL

With the dynamic pipe renewal, combined with the bursting method, damaged old pipes made of stoneware, asbestos and fibre cement, grey cast iron, plastic or concrete are shattered and simultaneously replaced by new pipes made of HDPE (long or short pipes) or PVC-U (short pipes) of an equal or even larger nominal width.

The pipe bursting method is applied when the function of the old pipe is impaired, e.g., in the case of misalignment, cracks, missing sole or partial collapse, or when a repair/sanitation is no longer possible. The method is also suitable for pipelines, where the hydraulic capacity needs improving, or when a new pipe with a higher wear reserve is requested.

APPLICATION



Dynamic Bursting method (long pipe)

Dynamic Bursting method (short pipe)

Trenchless renewal in the same bore path. Installation of a new pipe with the same or larger nominal width.

Dynamic Calibre bursting method (long pipe)

Partial damages are expanded dynamically and a new pipe is pulled in simultaneously.

Dynamic TIP (TIGHT-IN-PIPE) (short pipe)

Short or long pipe relining of concrete or stoneware pipes. The new pipe is tight fitted inside the old pipe.

FUNCTION | ADVANTAGES

GRUNDOCRACK

SIMPLY GOOD

GRUNDOCRACK
All highlights
at a glance



GRUNDOCRACK
Application
Videos at



TRACTO.COM/
APPLICATIONS

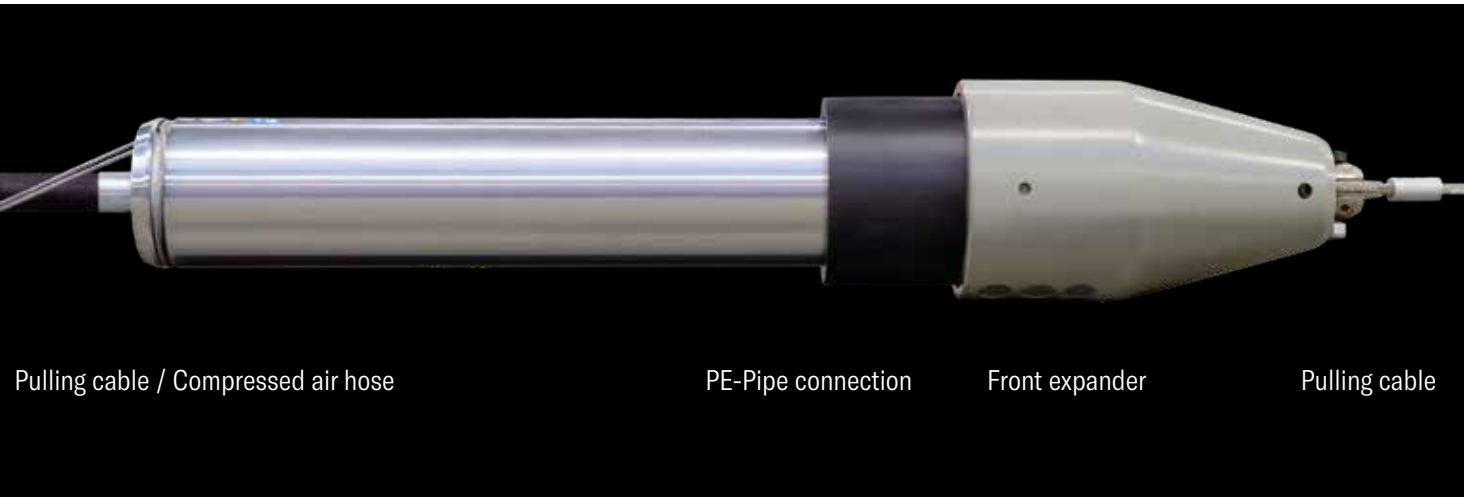
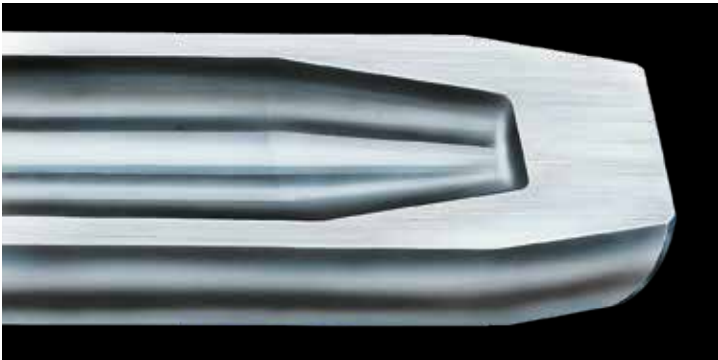
Reverse gear / Servo control

With the easy-to-handle servo control, you can switch over from forward into reverse gear by simply throwing the lever.



From one piece

The solid casing consists of only one piece, manufactured from a single forged part and then galvanised. Due to precise deep hole boring, the piston impact makes its way to the head of the machine, effecting direct force transmission.



VARIATIONS

GRUNDOCRACK



- Heavy-duty one-piece casing – without seams or screwed fittings
 - Smooth machine casing – simple retrieval of the machine through the new pipe in limited space
 - Reverse gear with servo-control – easy release of the cracking tools with ergonomic handling
- Pulling eye for cable connection – target-precise guidance of the cracker
 - Front cone – direct/optimal power transmission to the expander
 - Elastically mounted control stud – minimal wear even under high load

TECHNICAL DATA

GRUNDOCRACK-TYP	PCG 130	PCG 180	PCG 200	PCG 260	PCG 350
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 puter-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 (m³/min)	2,7 m³/min	4,5 m³/min	6,5 m³/min	12 m³/min	20 m³/min
With blade head	x	x			
With pulling eye		x	x	x	x

ACCESSORIES

GRUNDOCRACK
PERFECTLY EQUIPPED

In order to be able to adapt to the varying soil conditions, we offer a wide range of custom-fit accessories for pipe renewals.

SMOOTH EXPANDER



EXPANDER WITH CUTTING BLADES



SHORT PIPE TENSIONING DEVICE



Spannfix with pulling cable

7L-OIL LUBRICATOR



Installed between the compressor and the machine to enable lubrication of the internal piston.

FRONT EXPANDER



GRUNDOCRACK with smooth front expander and PE-pipe link for long pipes

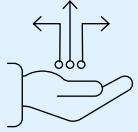
REAR EXPANDER (GRUNDORAM)



GRUNDORAM with rear expander, cutting blades and PE-pipe link for long pipes

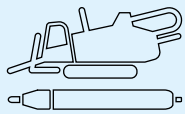
FULL SERVICE FOR TRENCHLESS TECHNOLOGY

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.



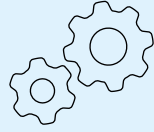
Financing

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.



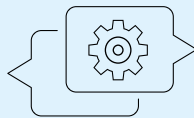
Geoservice

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.



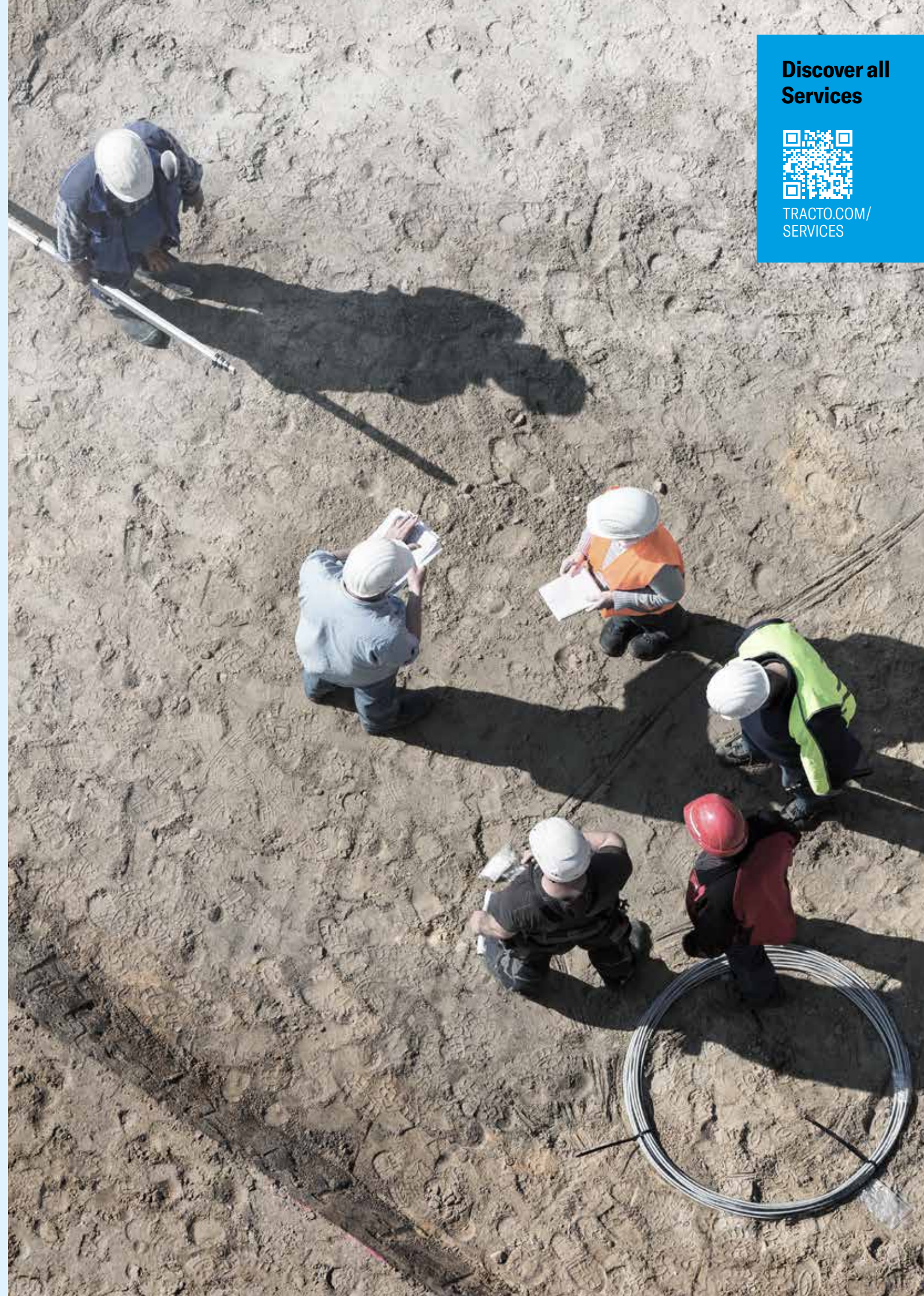
After Sales

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

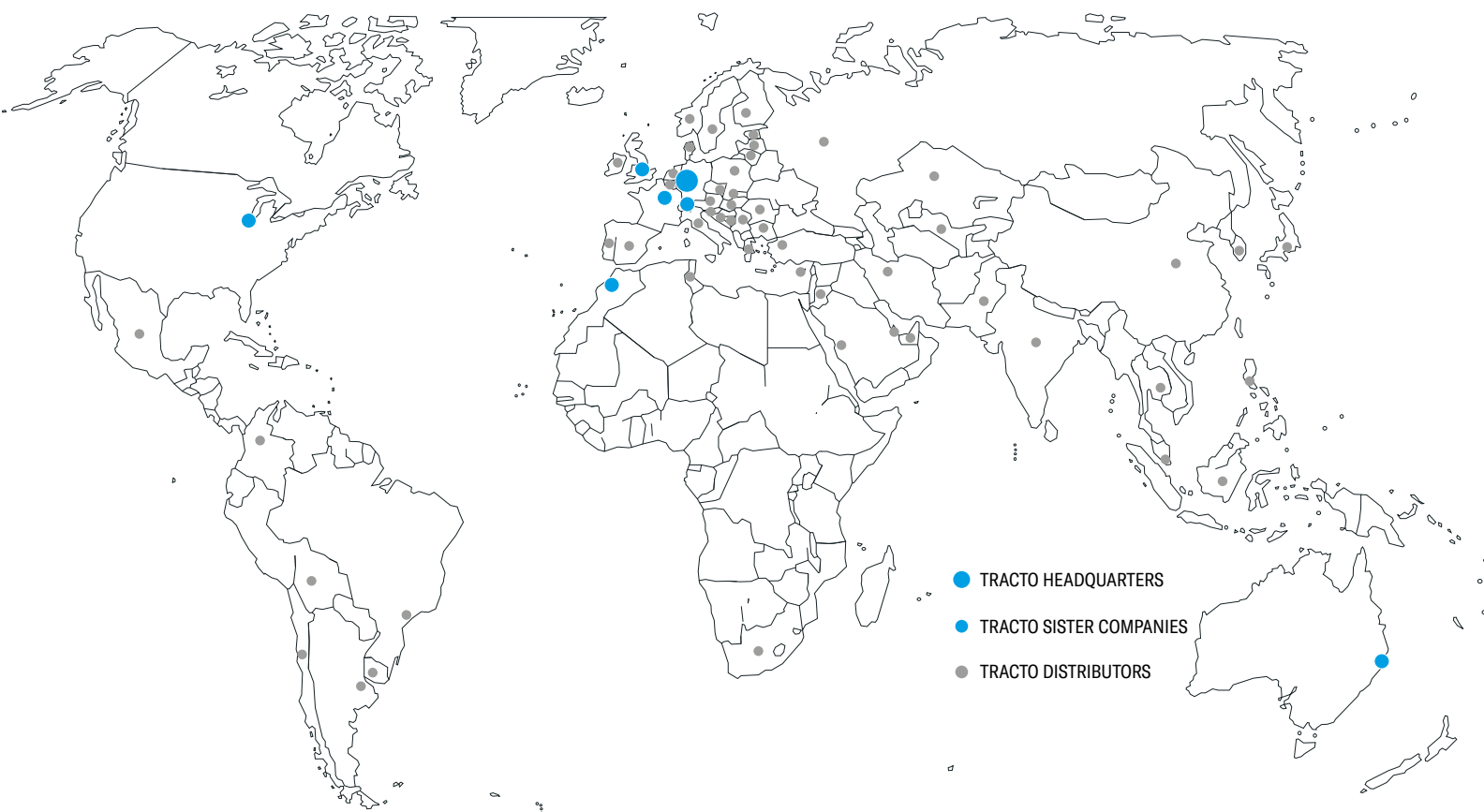


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