

INSPIRING TRENCHLESS TECHNOLOGIES



PIT
BURST
DRILL

GRUNDO MAT

RAM
CRACK
BORE

NODIG-SYSTEMS – TRENCHLESS AND INNOVATIVE

Overview of products and methods





COULD YOU BE PASSIONATE FOR SOMETHING YOU CAN'T SEE? WE ARE

TRACTO-TECHNIK were founded in 1962. In the early 70ties the family business specialised in trenchless installation technologies (Nodig systems) as well as in pipe fabrication and has consequently developed these divisions. The GRUNDOMAT soil displacement hammer have made TT a world market leader.

TT has 500 employees worldwide and exports to more than 70 countries. 5 manufacturing plants, sister companies in Switzerland, Great Britain, France, Australia and the US plus a dense worldwide sales & service partners' network ensure quick support and accessibility of services. TT owns more than 350 patents and have received numerous awards for innovations; among others the TOP 100 and the Axia Award.

THE STORY OF THE MOLE

When entering the trenchless technology market in 1970 the company founder Dipl.-Ing. Paul Schmidt started his search for a symbol with great force of expression. The mole quickly sprang to mind - an animal known as clever, reliable and hard-working.

Sepp Arnemann, a popular cartoonist, designed the trademark. The mole started a triumphal parade around the globe and is very popular to date. It has an excellent reputation and enjoys the business confidence of the customers. 91% of the respondents in this trade are familiar with the mole.



THE TRENCHLESS MARKET

The „moling technology“ is widely-used in the civil engineering branch. Its share compared to open trenching is ever increasing because the underground installation and renewal of supply and disposal pipes bears major technical and economical advantages as excavation and re-instatement work are almost omitted and construction times are short.

These advantages show especially in the production of property service connections and when crossing highly frequented traffic ways.

PRODUCT VARIETY

to reach the target without trenches:

- GRUNDOMAT – Soil displacement hammers
- GRUNDORAM – Horizontal rammers
- GRUNDOFIT – Fluid-assisted mini drill rigs
- GRUNDODRILL – Fluid-assisted HDD rigs
- GRUNDOBURST – Static pipe bursting systems
- GRUNDOCRACK – Dynamic pipe bursting systems
- GRUNDOBORE – Auger boring units



PROPERTY
CONNECTION



AIMING
ACCURACY

GRUNDOMAT

The crowning glory of soil displacement hammers

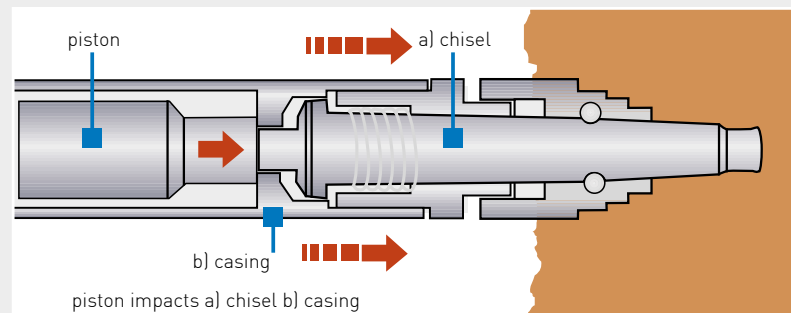
THE METHOD

The pneumatically driven hammers work according to the soil displacement method. When moving forward the spoil is displaced into the surrounding soil. That way a channel is produced into which socketless short or long pipes up to OD 160 made of plastic (PE, PVC or PE-X) or cables can be pulled in. Depending on the type of soil, lengths up to 25 m can either be pulled in successively or later on. A compressor with 6 - 7 bar operating pressure is required for this. Exact alignment of the machine with the target is necessary for a high aiming accuracy. To achieve this, the decisive factor is the 2-stroke principle.

THE FUNCTION

With the proven 2-stroke principle the piston initially strikes the multi-cutter cone which advances in order to produce the bore hole and to destroy any possible obstacles. The casing is imposed with the second strike and pulled in with the pipes attached. Peak resistance and casing friction are separated and alternately easier to overcome. This makes the GRUNDOMAT work dead on target even in stony grounds.

THE 2-STROKE PRINCIPLE: A TRACTO-TECHNIK CONCEPT

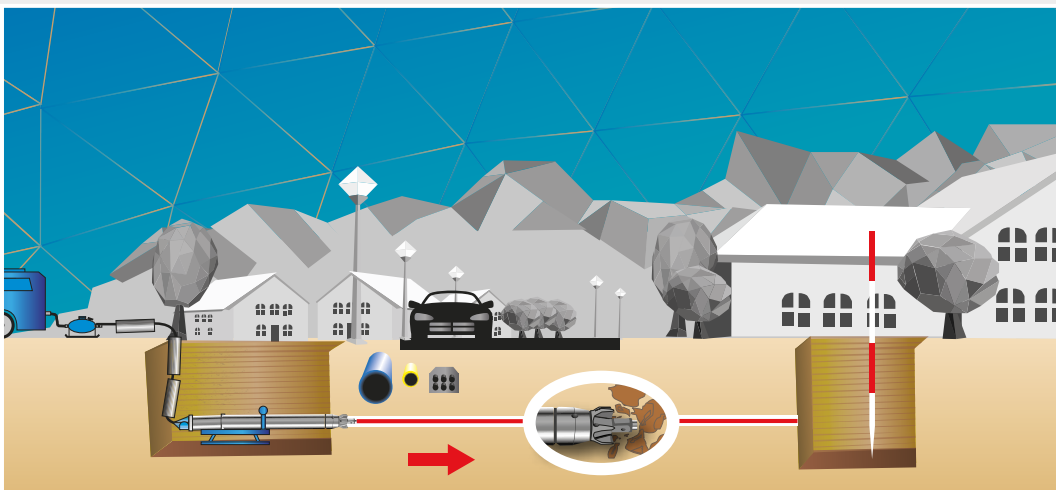


THE ADVANTAGES

- 2-stroke-principle for high aiming accuracy
- with stepped head or crown head for high penetration power
- 2-gear control stud + reverse gear for optimal adaption to the soil and high application safety
- simple control stud switch over
- premium steel quality - additionally treated - low wear and tear
- partially grooved casing for better grip
- detectable for highly sensitive applications
- well sealed for minimal air consumption
- easy to maintain
- safety pack, e. g steel rope insulator for additional operator safety
- practical accessories
- fast spare parts supply
- training courses



APPLICATION



To install property service connections for gas, water, sewage, power and broadband (FTTH) the soil displacement hammer can be started directly from the inside of a built-

ding. A head hole in front of the house wall is no longer necessary. This makes the application even more economical and the front garden remains untouched.

APPLICATION RANGE

Property service connections

Short undercrossings

Piling for foundations or signposts

Installation of short ground heat collectors

Pipe ramming from model 130

Pipe bursting from model 95

DIMENSIONS depending on model

Bore diameter: 45–180 mm

Length: 875–2,280 mm

Weight: 8–260 kg

Air consumption: 0.35–4.5 m³

Pipe Ø: 40–160 mm



POSITIONAL
ACCURACY



ROBUST
DESIGN

GRUNDORAM

TRACTO-TECHNIK's strongest force

THE METHOD

GRUNDORAM horizontal rammers are driven by compressed air, thus overcoming starting resistance easier after downtimes. Aiming accuracy is ensured because they are penetrating different soil formations instead of displacing obstacles as a whole into the surrounding soil layers. The soil is being picked up by the open steel pipe in the front and after installation water and compressed air can be used to empty the pipe.

THE FUNCTION

The air driven piston inside the machine body strikes against the ramming head. The kinetic impact energy which is released that way enables maximum advancing of the pipe string due to the optimal force transmission via the cones.

As the constant loads affecting the machine require maximum product quality, the one-piece casing (head and casing are one part) is made out of a solid block which is galvanized. The piston is subject to an elaborate hardening process. A tight sealing minimises air consumption. Thus GRUNDORAM stands for durability and reliability.

THE ADVANTAGES

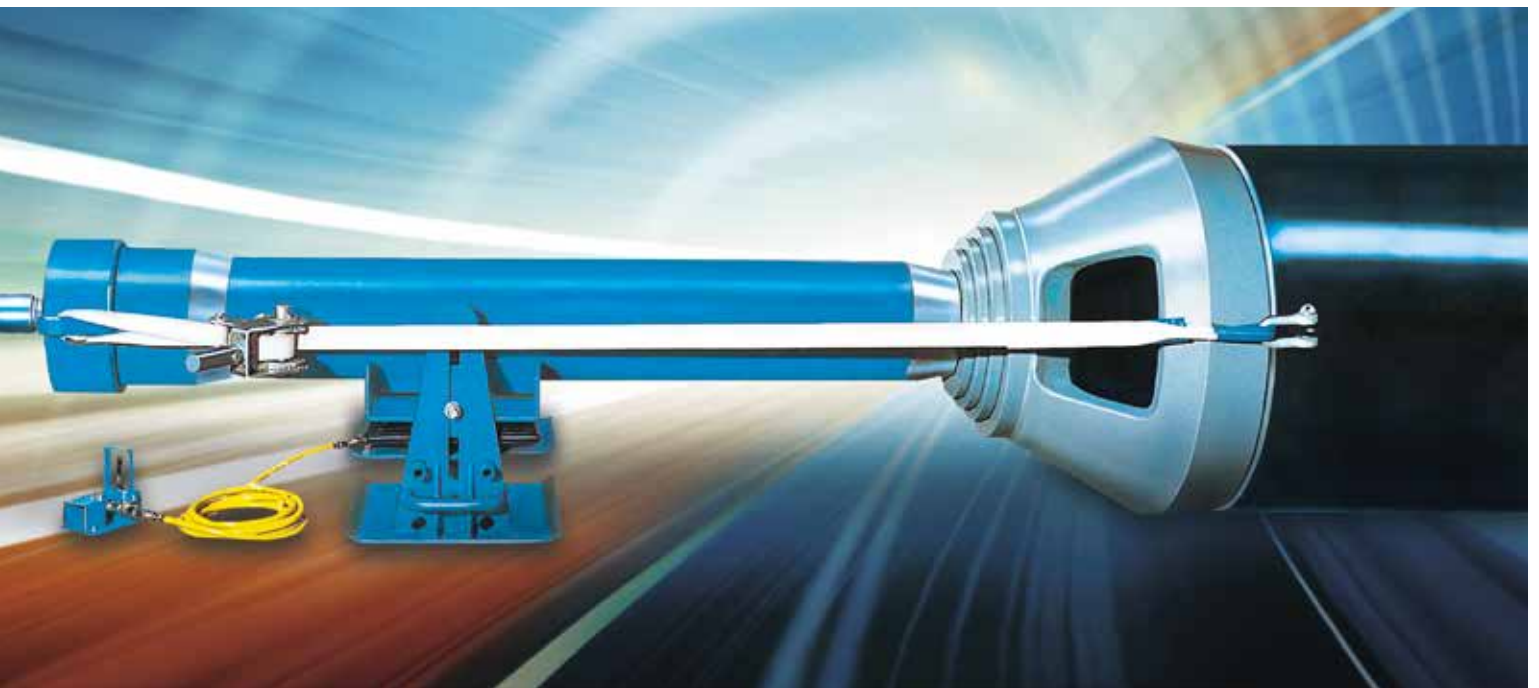
- robust
- resilient
- reliable

APPLICATION

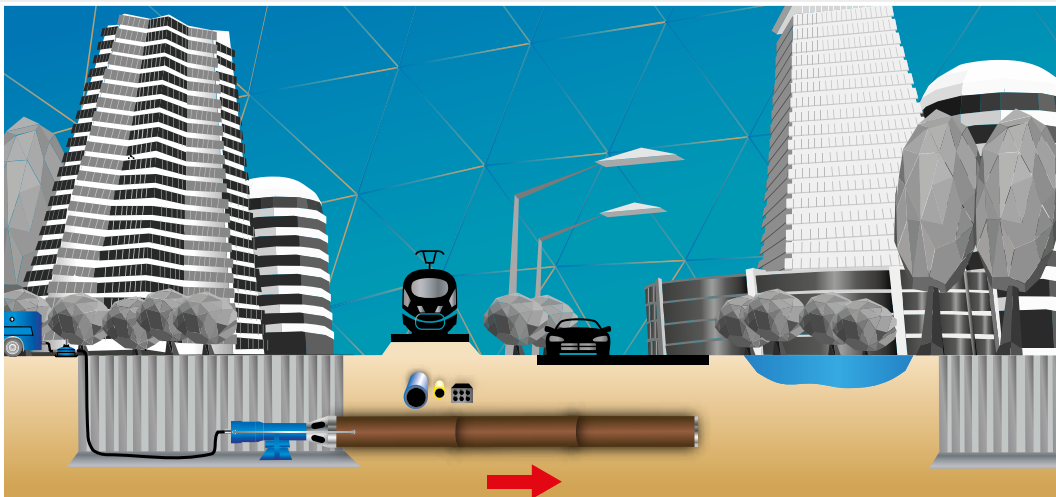
Using the steel pipe ramming method with GRUNDORAM railway tracks, streets, buildings and rivers up to a length of 80m can be undercrossed.

The TT rammers with a thrust performance of up to 40,000 Nm can be used to ram in steel pipes (up to a diameter of 4000 mm) in soil classes 1 – 5 (partly even class 6 – easily soluble rock) without any pressing abutments.

The steel pipe ramming technique is suitable for installing longitudinally or spirally welded pipes, seamless pipes and pipes with insulation protection as product pipes, e. g. in pipeline construction, or as casing pipes for supply and drainage pipe bundles. The rammers are also used horizontally for constructing underpasses, small outlets, pipe roofs for tunnel structures and for supporting HDD bores (HDD Assist). Vertical applications are foundations, sheet piling or well drilling.



APPLICATION



APPLICATION RANGE

Pipeline construction, crossings

Installation of steel protection pipes

Pipe roofs, railway underpasses, outlets

Laying of foundations, tree relocation

HDD Assist, ramming of sheet piles

DIMENSIONS depending on model

Machine diameter: 95–800 mm

Length: 946–4,400 mm

Weight: 59–11,500 kg

Air consumption: 1.2–100 m³



EASY
HANDLING



CONFINED
SPACES

GRUNDOPIT

minimally invasiv bores

THE METHOD

GRUNDOPIT is an easy to handle mini drill rig. Depending on the purpose of the bore, the diameter of the pipe, the type of soil and the level of difficulty you, can choose among a Power, Manhole or Keyhole model.

THE FUNCTION

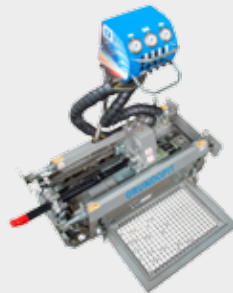
- can also be used with water only as drilling fluid
- can be disassembled in three parts thus applicable from out of the building without core drill, i.e. for FTTB, gas service connections
- with pneumatically driven hammer bore head assembly is safely applicable in alternating soils. If the hammer bore head meets with resistance (larger rock inclusions, solid rock, rubble deposits or brickwork), the hammer effect is activated automatically.
- the complete system with hydraulic power unit and mixing unit MA09 can be placed on a small trailer for safe transportation.
- especially suitable for installing property service connections

THE ADVANTAGES PIT^{6V+S}

- hammer bore head for alternating soils
- steerable bores
- dismountable
- portable
- applicable from out of the building
- quick, clean and economic execution
- excellent performance data
- stable construction
- high stability

THE ADVANTAGES PIT^K

- hardly any civil engineering works, gentle construction
- for property service connections from the keyhole into the building
- for installing charging stations for E-mobility
- assembly of the fittings above surface
- for controlled bores up to 25 m



GRUNDOPIT^{6V}
for bores out of a
construction pit or
the basement



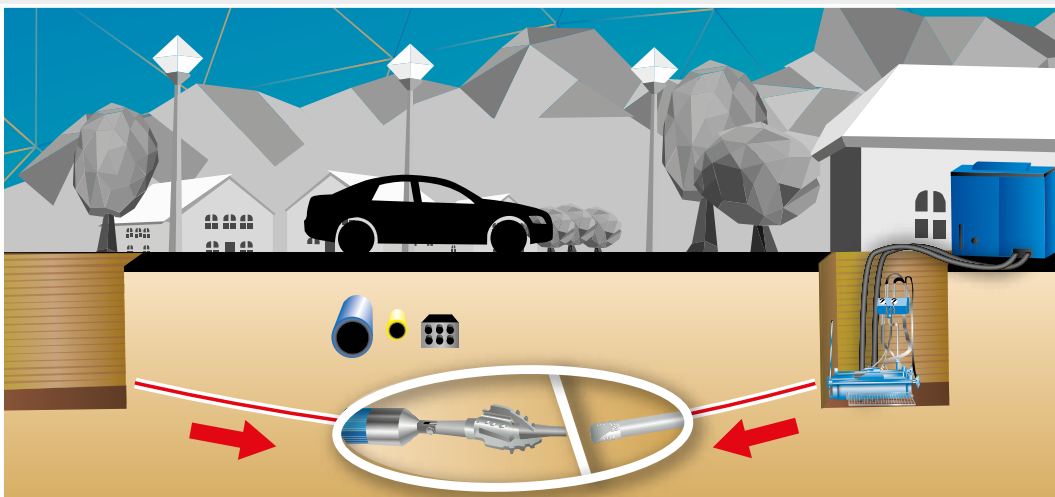
GRUNDOPIT^S
for bores out of a
manhole



GRUNDOPIT^K
for bores out of a
circular bore hole
(Keyhole)



APPLICATION



- for controlled and steerable bores
- for confined spaces with high precision requirements
- property service connections underneath staircases, walls, slopes etc. where the Grundomat cannot be applied
- up to 100 m bore length
- for bores right into the building
- for bores from a keyhole \varnothing 650 mm from manholes $\geq \varnothing$ 1 m (GRUNDOPIT[®])
- quick, clean and economic execution

APPLICATION RANGE

Property service connections

Data, supply and drainage lines

Bores right into the building

Bores from a keyhole $\geq \varnothing$ 650 mm

Bores from manholes $\geq \varnothing$ 1 m

DIMENSIONS depending on model

Length: 430–2,800 mm

Width: 480–930 mm

Height: 450–480 mm

Weight: 250–650 kg

Pipe \varnothing : 63–200 mm



LOW
CONSUMPTION



LONG
LIFE CYCLE

GRUNDODRILL

intelligent and powerful

THE METHOD

HDD pipe installation is divided into the following working steps:

- establishing a controlled pilot bore
- upsizing the bore hole to the required diameter
- pulling back the drill rods and simultaneously pulling in the new pipe

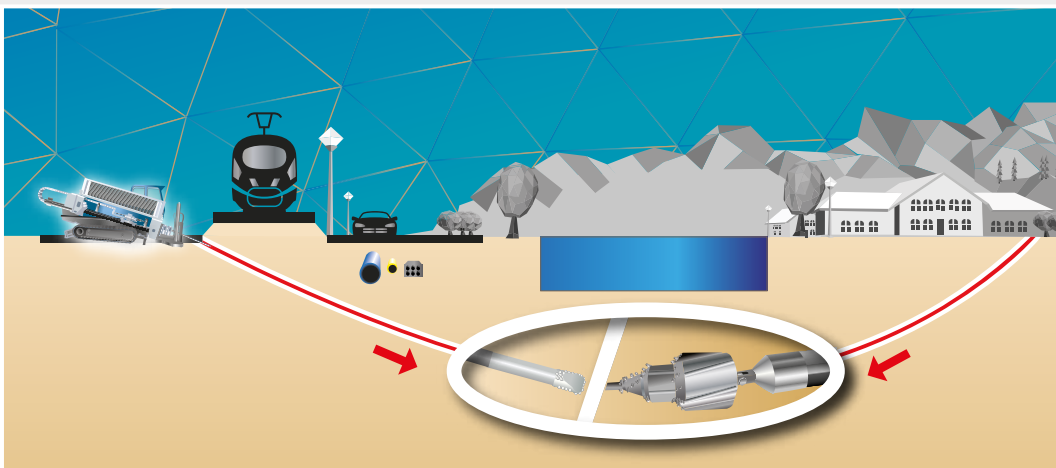
The drilling fluid (water /Bentonite) plays an important part in successful installation. It helps to extract the soil, transports the spoil to the outside and provides a supportive pipe gliding quality.

THE ADVANTAGES

- flexibly steerable and universally applicable (in all types of soil)
- suitable for bores through rock
- bore data display and log acc. to the latest standards
- tensile load display and log in combination with GRUNDODOLOG tensile load measuring device
- quick diagnosis with telemetric data transfer
- spacious and pivoting cabin with all-around view, comfortable ergonomic seat, multifunctional joystick control, function control via LCD display
- efficient state-of-the art engine technology
- load-sensing hydraulics
- excellent performance data (thrust, pullback, torque)
- high stability due to up-to-date undercarriage
- space-saving design



APPLICATION



The application range includes several challenging projects such as gas, district heating, supply of drinking water, installing sewage pressure pipelines, cable protection pipes for the supply of broadband internet as well as telecommunication, traffic management

systems, emergency call pillars, low-, medium- and high voltage cables, fibre optic cables, parallel installations, crossings, crossing under waters and other traffic ways, also in rocky soil.

APPLICATION RANGE

Undercrossings

Parallel bores

Installation of protection pipes

Bores through rock

DIMENSIONS depending on model

Length: 3,500–7,300 mm

Width: 1,200–2,530 mm

Height: 1,860–2,900 mm

Weight: 2,140–19,000 kg

Max. engine output: 28–224 kW



EASY
HANDLING



PIPE
RENEWAL

GRUNDOBURST

Pipe renewal at its best

THE METHOD

For the past 30 years pipe bursting has been a worldwide approved method for the renewal of pressure and gradient pipes.

In process, so the old pipe is replaced by a new pipe of equal or larger diameter. From out of a machine pit lengths of up to 150 m can be achieved in both directions.

The special features are the QuickLock bursting rods which are not screwed together but simply and firmly connected with a click-shut coupling. This makes handling on site much easier. Also slight bends can be driven with these bursting rods.

THE FUNCTION

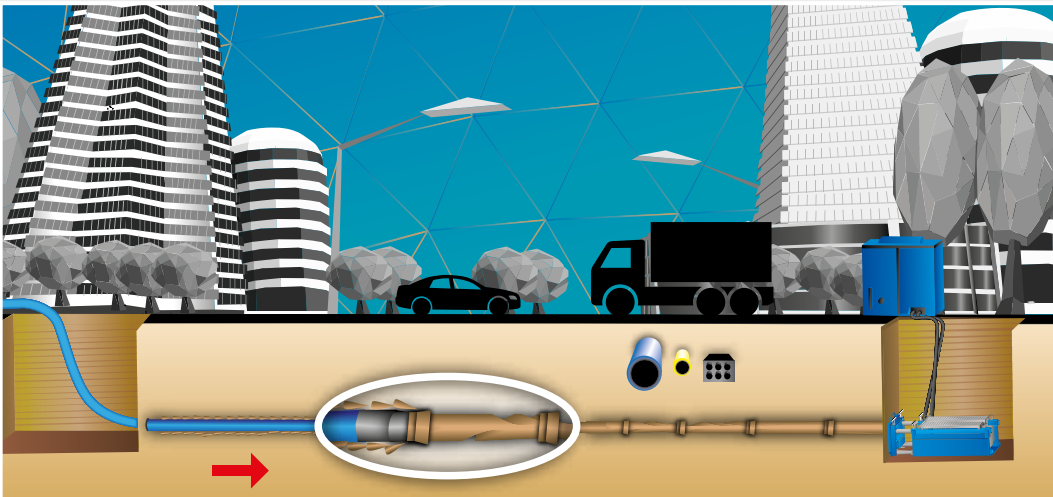
- by means of the powerful and rigid GRUNDOBURST pulling rigs damaged pipes up to Ø 1,200 mm (circular and oval profiles) can be renewed without trenches.
- at first the pulling rig pushes the bursting rods through the old pipe. After the cutting tool and the new pipe have been attached, pipe pulling starts
- the machines provide a pulling force of 40 t to 250 t

THE ADVANTAGES

- applicable for almost all types of damages and old pipe materials
- bursting and cutting of old pipes made of stoneware, concrete, PVC, PE, cast iron, ductile cast iron, AC, GRP, steel
- new pipes made of PE, PP, stoneware, ductile cast iron, GRP, steel can be pulled in
- a long service life of 80 - 100 years for the new pipe
- diameters up to ND 1200
- replacement lengths up to 300 m.
- upsizing of the old pipe by up to 1 - 2 nominal widths
- simple and safe QuickLock bursting rod connection
- short construction times, short set-up times
- no new bore paths necessary.
- cost saving of 15% to 40% compared to open trenching
- minimal impairment of traffic and environment
- hardly any long-term damages such as soil settlement, ground water interference or road damage
- safe and approved method according to the latest technical standards and regulations



APPLICATION



- Pipe bursting: new pipe of equal or larger diameter
- Reduction method: reduction of the pipe's cross section during pipe pulling
- TIP method (Tight-in-Pipe): new pipe is installed closely fitting in the old pipe
- Pipe relining: slight reduction of the pipe's cross section

APPLICATION RANGE

Pipe bursting

Pipe relining

Reduction method

TIP

DIMENSIONS depending on model

Length: 600–2,950 mm

Width: 490–1,600 mm

Height: 340–1,500 mm

Weight: 200–4,070 kg



PIPE RENEWAL



ROBUST DESIGN



GRUNDOCRACK

with dynamic energy

THE METHOD

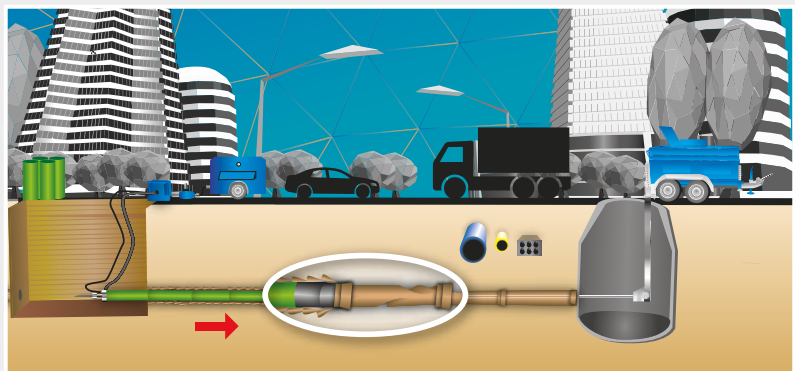
With the dynamic pipe bursting system, old pipes made of stoneware, asbestos cement, grey cast iron, plastic or plain concrete are shattered and simultaneously replaced by new HDPE pipes (long and short pipes) or PVC-U pipes. Intermediate pits are required for strong bends and branches. Inspection chambers can be used as starting and exit pits. Modified pipe rammers are applied for this method.

THE ADVANTAGES

- environmentally sound
- innovative
- quick
- calculable in advance
- simple, safe and leak-proof
- no incidental costs

THE FUNCTION

The pipe bursting machine shatters the old pipe while advancing through and radially displaces the fragments into the surrounding soil. The bore hole for the new pipe is extended at the same time. The pulling force of a winch supports the bursting machine and guarantees sure guidance through the given path.



APPLICATION RANGE

- Impaired old pipe statics
- Misalignment, cracks, missing invert
- Partial collapse

DIMENSIONS depending on model

- Length: 946–3,645 mm
- Weight: 60–4,800 kg
- Number of strokes: 180–580 min⁻¹
- Air consumption: 1.7–50 (m³/min)



POSITIONAL
ACCURACY



GRUNDOBORE

efficient system solutions

THE METHOD

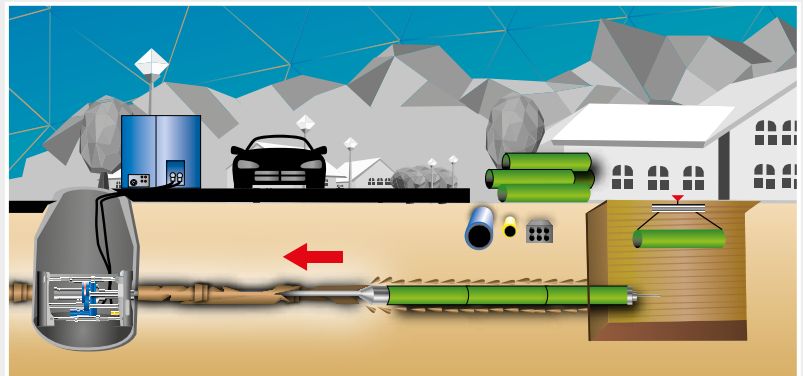
The auger boring method is a safe trenchless technology for the steerable installation of pipes at high positional accuracy as for example required in sewer construction or for pipe installation underneath railway tracks.

THE FUNCTION

GRUNDOBORE is lowered into the starting pit or starting manhole. An external hydraulic unit supplies GRUNDOBORE with hydraulic operating power.

THE ADVANTAGES

- 1m-manhole version
- simple installation due to separable system components
- transportation of waste spoil into the target pit
- high positional accuracy
- pressings up to approx. 50 m
- detection system: laser-mirror



GRUNDOBORE^{200S} in use

APPLICATION RANGE

Sewer property connections

Pressings

Free-flow pipelines

DIMENSIONS depending on model

Length: 960–2,100 mm

Weight: 395–1,095 kg

Max. hydraulic pressure: 250 bar

Pipe Ø: 280–406 mm

PRODUCT FEATURES

at a glance

GRUNDOMAT Soil displacement hammers



PROPERTY
CONNECTION



AIMING
ACCURACY

16 models
up to Ø 160 mm, since 1970
N version with crowned or stepped head



GRUNDORAM Horizontal rammers



POSITIONAL
ACCURACY



ROBUST
DESIGN

For pipe installations
up to Ø 4,000 mm
13 models



GRUNDOPIT Mini fluid-assisted drill rigs

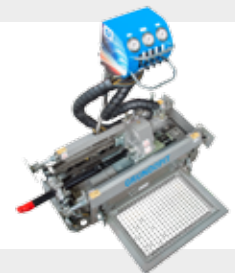


EASY
HANDLING



CONFINED
SPACES

4t pullback
New pipe installations up to Ø 200 mm
Models: 6V, Manhole, Keyhole



GRUNDODRILL Fluid-assisted HDD rigs



LOW
CONSUMPTION



LONG
LIFE CYCLE

4–28 t thrust and pullback
New pipe installations up to Ø 710 mm
Models: 4X, 10XP, 15XP, 15XPT, 18N, 28Nplus and
rock drilling rig 18ACS





GRUNDOBURST static pipe bursting systems



EASY
HANDLING



PIPE
RENEWAL

for pipe renewal up to \varnothing 1,200 mm
also for pipe reduction and relining
Models: 400G , 400S, 800G, 1250G, 1900G and 2500G.



GRUNDOCRACK dynamic pipe bursting systems



PIPE
RENEWAL



ROBUST
DESIGN

for pipe renewal up to \varnothing 1.000 mm
cable winch pulling support
Inspection chamber can be used as pit



GRUNDOBORE Auger boring units



POSITIONAL
ACCURACY

pilot-steered,
e.g. for free-flow pipelines, pressings
Models: 200S and 400





HOW DO WE EVALUATE OUR SERVICE PERFORMANCE? YOUR GUT FEELING IS TELLING US!

TAKE ADVANTAGE OF OUR SERVICES

Alongside our products we offer a variety of services.



SPARE PARTS

Available for all products on the spot.



MAINTENANCE

We offer on-site maintenance and repair almost anywhere.



ACCESSORIES

To equip you perfectly, we offer a wide range of accessories and custom-built accessories for our products.



TRAINING

We provide a diversified training programme which is attended by more than 3,000 participants annually.



GEOSERVICE

We examine the soil conditions prior to a bore on your behalf.



SERVICE HOTLINE

If you have any products and service related questions call us at: +49 2723 808-0



EVENTS

We host a variety of events: from exhibitions over project weeks to our Hands on Days.



INTERNET

Visit our website to learn more about the different products and applications.

www.TRACTO-TECHNIK.com



EXPERT INSPECTION

We conduct the statutory expert inspections on your behalf.



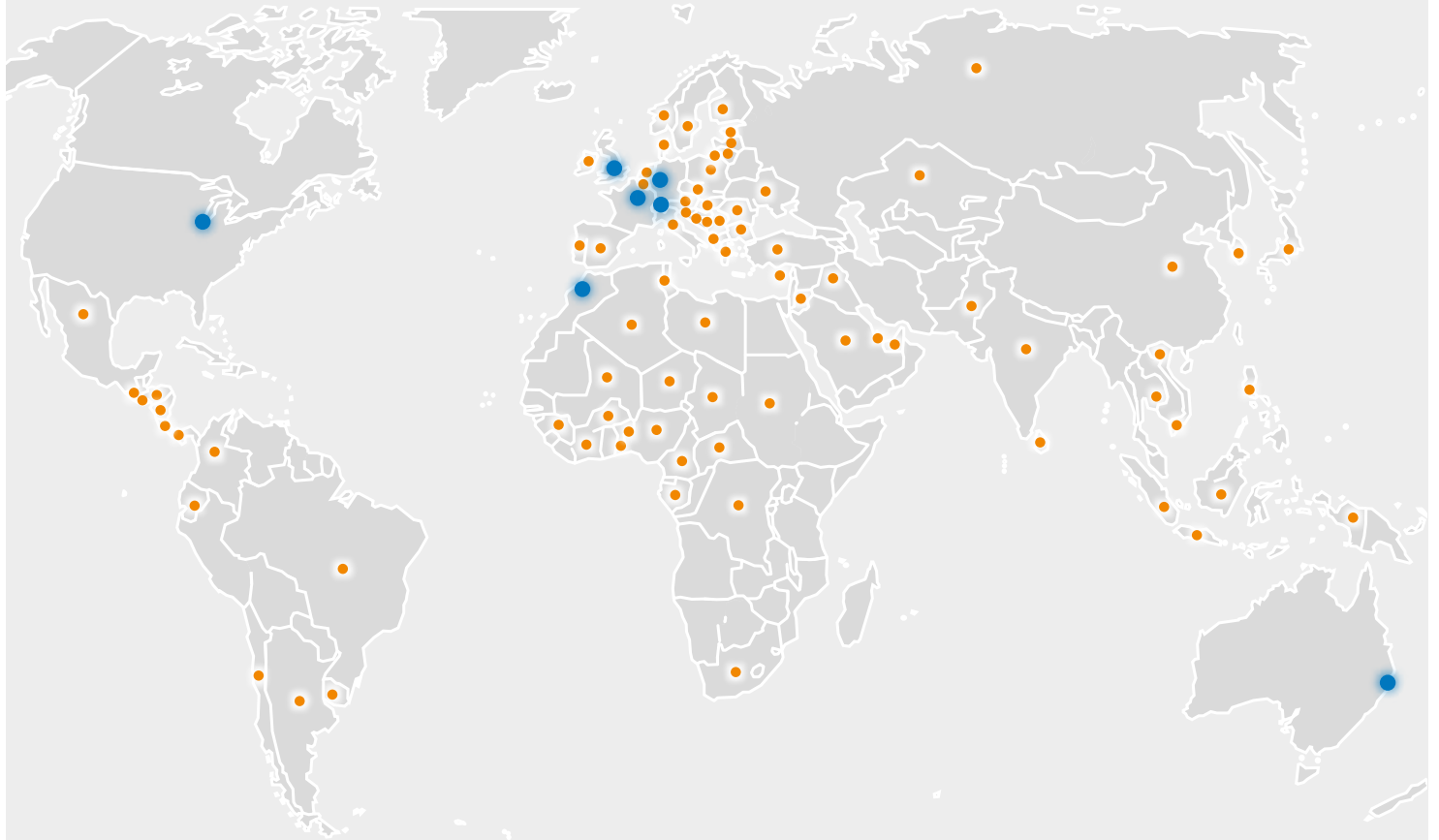
YOUTUBE CHANNEL

Get inspired by our application videos:

www.youtube.com/TractoTV

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INSPIRING TRENCHLESS TECHNOLOGIES

