

The development clock impressively shows the innovation speed of the steerable GRUNDODRILL bore rigs over the last 20 years. There was hardly a year without any improvements. Sometimes they were only small items, but sometimes visible fundamental improvements. The alterations always base on customer feedback and learning by doing. This is how the TT GRUNDODRILL bore rigs reached their high development level of today.



Made in Germany

Two great models

15N ↔ 25N



Modern instrument panel with coloured display and bore data storage.

Both HDD bore rigs GRUNDODRILL 15N und 25N set new standards for automating and operating. 20 years of application and manufacturing experience have been integrated into the development. This includes a powerful **Mixing system MA 07** with a mixing and storage tank of 4000 l capacity each Type of drive: with power aggregate, hydraulic power unit or Diesel engine.

Pre-adapted for:

- Cable guided bores
- Rock drilling
- Tensile strength measuring with remote transmission (Grundolog III)

Drive power:	106 kW (142 PS)	190 kW (255 PS)
Torque:	7000 Nm	10000 Nm
Pipe diameter:	up to 600 mm	up to 700 mm
Bore length:	400 m	500 m
Thrust & pulling force:	15 t	25 t
Percussive hammer:	1500 strokes/min	1500 strokes/min
Drill rod magazine:	210 m	288 m
Bentonite pump:	320 l/min.	500 l/min

Both bore rigs have a spacious, comfortable operator cabin (weight dependant seat adjustment), air conditioning, floor heater, separated front screen, toned screens, radio, CD player, inner lighting, 2 outer spotlights, anti-theft device and removable roof, function check with coloured displays including bore data storage.

NEW

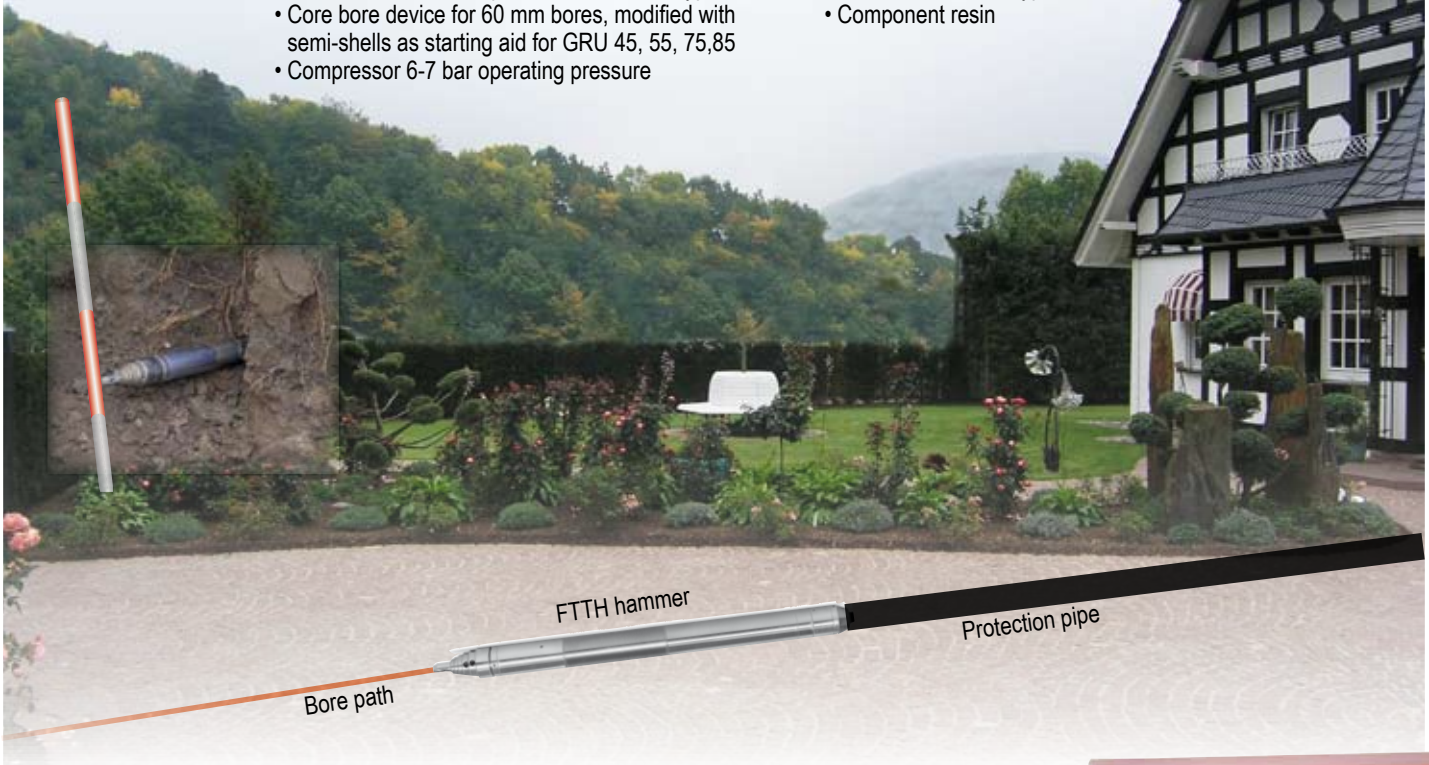
House connection "Fibre to the home" with Grundomat

System equipment consisting of:

- GRUNDOMAT soil displacement hammer, type 55 mm
- Core bore device for 60 mm bores, modified with semi-shells as starting aid for GRU 45, 55, 75,85
- Compressor 6-7 bar operating pressure

Wall duct hammer FTTH:

- Wall duct hammer Type „MIS 60“
- Component resin

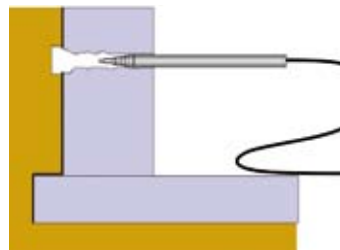


Micro pipe

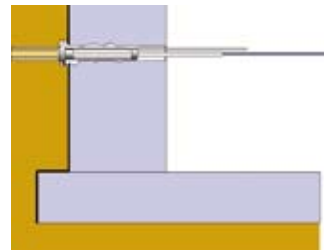
Working steps:



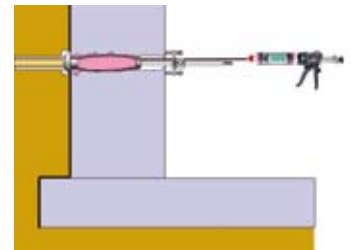
1. Core bore, 60 mm Ø.



2. Soil displacement bore Ø 55 mm with protection pipe installation OD 32.



3. Installation of the building passage.



4. Sealing off with the consistent resin distribution in all hollow openings.

At the latest, when a house connection is required for retro-fitting, the GRUNDOMAT soil displacement hammer is required. Especially when developing a glass-fibre cable network, usually cost saving solutions for the "last mile" (house connection) are required.

The bore is started from a core bore inside the cellar. This provides the required bore path. The passage in the wall-work closes and seals off the building entrance reliably after the hammer has bored through the hole. It makes sure that the wall-work remains dry.

Application: Fibre to the home (FTTH) glass-fibre house connections (also for other lines such as gas, water etc.).

Type: FTTH soil displacement hammer GRUNDOMAT, 55 mm Ø, for all displaceable soils.

Lengths: 10-15 m.

Operation: With Compressor (6-7 bar operating pressure).

Pipes: HD-PE protection pipe OD 32; A micro pipe is pushed into this protection pipe, in which the glass-fibre cable is later blown into. After pushing the micro pipe in, the protection pipe can be pulled out of the bore hole again.

[More...](#)



Cross-section of the wall-work with sealed off wall entrance and micro pipe.

GRUNDORAM (Application in Bahrain) „saves“ blocked HDD-drill rod length

Jobsite: Damman/Bahrain
Customer: Digital Connection Ltd (DCL)
Task: During the expanding process of an approx. 3 km long bore for a 800 mm oil pipeline from the mainland to the island of Abu Ali, the HDD bore rods had got jammed in the ground. To be able to loosen the drill rods, the GRUNDORAM Taurus was applied to free the 170 mm drill rods with it's dynamic ramming energy. The HDD rigs with 400 t and 250 t pulling force, which were synchronically used at the start and the end, indicated during their torsional checks that approx. 1800 m of the total amount of 3000 m had got jammed.

The jobsite was at a stand-still for 3 months and a solution to this problem frantically searched for.
Solution: The idea to solve this problem was found on the TTUK website by the executing company. A Taurus rammer with 18400 Nm ramming power was to be used to strike the drill rods out. An adapter to retain the drill rod was constructed and attached to the front of the rammer. The Taurus has an air consumption of 50 m³/min and was driven by two Ingersoll Rand 9/235 compressors. After the tests and the conversion on the second day the retrieval task could begin.

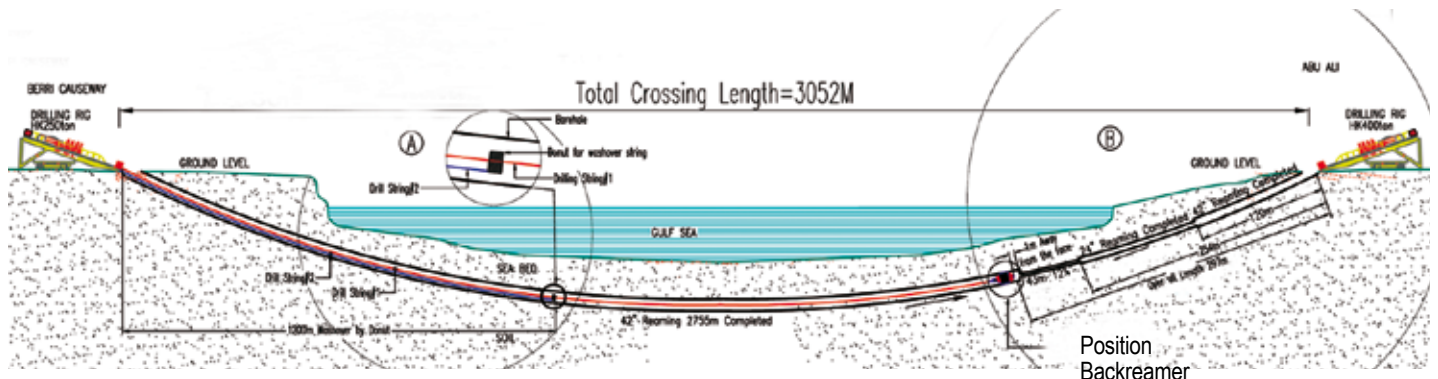
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The 800 m oil pipeline ready for installation.



HDD-bore rig 250 t on the mainland.



Bore path, length: 3000 m, installation depth: max. 45 m below the sea bed.
 The ramming technology from TRACTO-TECHNIK has been proven in these types of applications before and is available at short notice.



Adapter to HDD rig with flanged on HDD drill rods.



Adapter to HDD-Rig with Taurus rammer and suitable cone.



After freeing the drill rods, it was possible to retrieve the backreamer.

GRUNDOBURST 2500 G (CH) replaces concrete pipe 800mm with PE-pipe 900 mm

- Jobsite:** Eyfuhren, Rüderswil CH
- Type of pipe:** Water transport pipe Emmental, open slope
- Old pipe:** ND 800 concrete
- New pipe:** OD 900 x 53,3 mm, SLM DCT RC Plus PE 100, SDR 17, PN 10 (12 m rods)
- Length:** 1st bursting section approx. 120 m;
2nd bursting section from same pit approx. 200 m
- Depth:** 1,80 m – 2 m over-cutting
- Machine:** GRUNDOBURST 2500 G,
driven with hydraulic power unit TT B 250
- Accessories:** PE long pipe expander OD 920,
conversion to OD 1060 with blade strips
- Expander:** From ND800 to OD 1060
- Pulling force:** 140 - 160 t
- Soil:** Loam, compact
- Duration:** Including set-up times, rod installation and retrieval
process for first section: 1,5 working days
- Video:** www.tracto-technik.com
[Video - Gallery -> Pipe renewal](#)



The pipe length shortly before starting the installation with two-step expanding process.



Starting the bursting process and destroying the old pipe.



View inside the old pipe with bursting rod and bursting head.



The machine pit is used in both directions. After completion of the first bursting section the GRUNDOBURST is used for the second bursting section in the opposite direction.



Long pipe expander ND 1060 with blade strips.



The new pipe with pulling eye after installation.



End of the bursting process and arrival inside the machine pit.



Partner and adviser:

G'BURST 800 G in Bombay (IN) Replacement of a 230mm clay pipe



Contractor: Municipal Corporation of Greater Mumbai (MCGM)
Consignee: KEPL, Bangalore
Old pipe: Clay pipe, inner Ø 150 mm and 230 mm,
New pipe: PE, Ø 315 mm and 355 mm
Test path: In total 500 m in sections of 60-100 m
Machine: GRUNDOBURST 800G
 GRUNDOCRACK 260 with
 10 ton winch GRUNDOWINCH

Task: Renewal of a total of 17 km clay sewage pipes in the inner city region of Mumbai to increase the hydraulic capacity of the sewage network. It was expected that the old sewage pipes would have thick concrete layers in numerous areas. Therefore the application of a GRUNDOCRACK type 260 mm with a winch will be required. The total contract value is 2.5 million US dollars. Due to the monsoon season, interruptions will be expected, meaning the task will not be completed before the end of 2009.

Construction time: 500 m in 6 working days

[More...](#)



The GRUNDOBURST was blessed in a Hindu ritual before starting work with the machine.



Target reached:
The 355 mm PE-pipe is pulled through the telescopic frame of the GRUNDOBURST.



Overview of the GRUNDOBURST jobsite in Mumbai.



Installation of the GRUNDOBURST in the working pit.



Retrieval of the expander from the target pit.

GRUNDOBURST 2500 G (NO)

replaces 300er concrete pipe with a 560 mm PE-pipe

Jobsite: Husing estate in Aagots near Oslo, Norway
Type of pipe: Sewage pipe
Reason for renewal: Increase of the hydraulic performance capacity
Old pipe: ND 300 with a 15 - 20 cm thick cement protection coating, 45 years old.
 Open trenching was not possible in this case due to building construction measures along the road.

New pipe: HD-PE OD 560 100 SDR 17
Length: 50 m
Depth: 3,5 m
Machine: GRUNDOBURST 2500 G
 driven with hydraulic power unit TT B 250

Expander: 3 expanding operations in one working process with a 290 mm special blade strip, followed by PE long pipe expanders with blade strips 445 mm and 610 mm

Pulling force: 140 - 160 t
Soil: Loamy ground

Special aspects: A further concrete pipe ND 900 ran parallel to the sewage pipe. Drainage was necessary.
Duration: Start: Nov. 24.,2008 - End: Nov. 27.,2008
Execution: SANDUM A/S, 3371 Vikersund, Norway



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GRUNDOBURST 2500 G during pipe installation.



Start of the pipe installation with the special blade strip and the follow-on PE long pipe expanders.

PE long pipe expander Ø 610 mm with HDPE pipe OD 560.

Pipe installation into the expanded soil.

Bursting process during the arrival in the pipe installation pit.

Short portrait of SANDUM A/S



Foundation: 1978 by Ola SANDUM
 Since then there has been a very close c-operation between TRACTO-TECHNIK and SANDUM A/S. The reason being the immense know how, the high quality machine technology and the support through ABS (Roar Skryseth).

First machine: GRUNDOMAT 130

1985: Purchase of a GRUNDORAM type Gigant for the installation of a steel pipe 609 x 10 mm.

1988: Entered the market for sanitation products with a 5 t Bagela winch and a GRUNDOCRACK type Mini-Atlas.

1990: Purchase of a GRUNDOCRACK, type Atlas, Herkules, a further Gigant and a Goliath, which was also used as a rammer and a 20 t Bagela winch. The Goliath, which was not only used for pipe cracking but also for steel pipe installations of Ø 800 mm over 100 m lengths. Using the pipe cracking method, concrete pipes ND 450 mm were replaced with PE pipes Ø 630 mm.

1999: Due to the positive experiences the step into the static pipe bursting market was taken with GRUNDOBURST. SANDUM A/S invested in a GRUNDOBURST 400 G, which was applied to renew ailing drinking water pipes. Within the last 10 years a total of 6 GRUNDOBURST units have been purchased. These range from GRUNDOBURST 400 G, GRUNDOBURST 800 G and 1250 G right up to the largest unit, the GRUNDOBURST 2500 G, rounding off a complete machine fleet.

Tips for maintaining and checking bursting rods For safe applications

INFO → ←



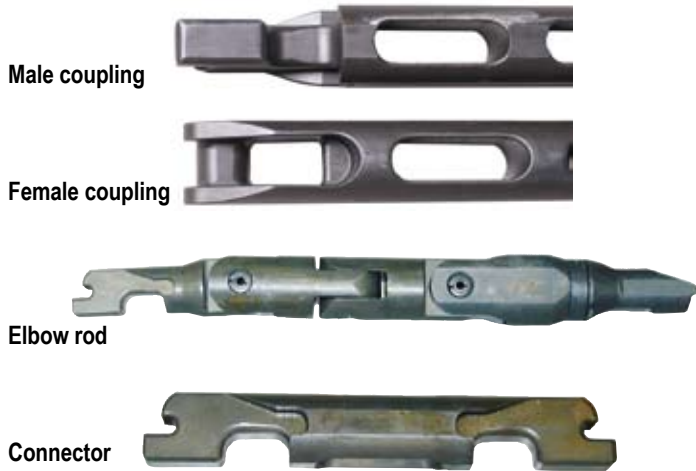
I. Visual inspection

Always carry out a visual check before starting to work.

The bursting rod, Quick-lock connector, elbow rod and other accessories must not show any damages, such as tears, deep notches, abrasion or a bent male or female coupling. In these cases the bursting rod, rod connections or accessory are no longer applicable and could damage during the bursting process. Please only use intact rods.

II. Storage and corrosive protection

Always clean the bursting rods after use and protect them, if necessary against corrosion by adding corrosive protection (oil or wax) thoroughly to the rod ends. Make sure the storage area is dry.



III Crack test – quick test by means of dye penetrant inspection MET-L-Check

You need 3 spray cans (400 ml each) for the crack test:

- Special cleaning agent **NPU** Part. No. 469703.1
- Penetrant **Dye VP** Part. No. 469702.1
- Developer **D70** Part. No. 469701.1

1. Clean the rods from dirt after each use.
2. Clean the rod ends by sandblasting or remove rust and deposit mechanically.
3. Degrease the rods using the special cleaning agent **NPU**.
4. Spray the Penetrant **Dye VP** on the rods. Leave the penetrant on for approx. 15 minutes, depending on the temperature.
5. Remove the Penetrant **Dye VP** from the rod surface using the special cleaning agent **NPU** or water.
Note! The penetrant stays in the cracks.
6. Let the rods dry. The rod surface must be totally dry.
7. Apply a razor-thin layer of the Developer **D70**.
Note! After a short drying time the Penetrant **Dye VP** leaks out from the cracks forming a red contrast to the white developer.
8. Inspect the rods thoroughly. Red lines in the white developer layer indicate cracks, punctual discharges indicate pinholes in the rods.
Note! Cracks shine in a bright red when illuminated with UV light. That way, faults can be detected more easily.
9. Remove the chalk layer from the rods after the crack test.
10. Conserve the rods using **TECTYL-400C** Order No. 460509.3 (25 l cask). Equal agents can also be used.

Warning!

Defective rods can cause damage during the bursting operation. Use only intact rods. Sort out the defective rods.

IV. Service / Order hotline

Tel.: +49 2723 808-238 • Fax: +49 2723 808-180

Email: bjoern.freimuth@tracto-technik.de

NEW



Video films

There are numerous new video films, which you can look at directly on the internet, but also order as a DVD in German or English by contacting carola.schmidt@tracto-technik.de.

Percussive hammer animation

German: <http://rohrverlegung.tracto-technik.de/index.cfm?menuID=202>

English: <http://pipelaying.tracto-technik.com/index.cfm?menuID=187>

Geothermal bores with GRDbore rig - Application in the Galileo-Park

German: <http://geothermie.tracto-technik.de/index.cfm?menuID=80>

Pipe bursting

German: <http://rohrverlegung.tracto-technik.de/index.cfm?menuID=196>

English: <http://pipelaying.tracto-technik.com/index.cfm?menuID=193>

Exhibition dates 1st half year 2009 Please make a note!

Infra Tec	Rotterdam / NL	January 13 -16
Trenchless Middle East	Dubai / UAE	February 16 -17
Baumaschinenmesse	Bern /CH	March 17 - 22
MAWEW	Kottingbrunn / A	March 25 -28
Wasser Berlin	Berlin / D	March 30 - April 3
INTERMAT	Paris / F	April 20 - 25
SED	Rockingham / UK	May 12 - 15

HDD: GRUNDODRILL 4X ideal for novices

The small, compact and consequently very versatile HDD bore rig GRUNDODRILL 4X stood the test, particularly in narrow working conditions and in sandy clay soils. Due to the small set-up space required and the low weight hardly any surface damage is caused. Especially in difficult to access regions, where the transport of heavy equipment is a real problem, for example in residential areas, in narrow alleys, with domestic connections for sewage water, fibre optic cables, gas and water or with the connection for wind power plants, the GRUNDODRILL 4X is the ideal bore rig.

With an operating range of more than 100 m the bore hole can be expanded to maximally 235 mm. Two mixing systems are alternatively offered to support the achievement potential of this bore rig. Especially recommended for novices.



Application example:

Visitors to Schmallenberg can see life-size concrete figures of every day people, made by the artist Christel Lechner. On a traffic island a couple of life sized figures are sitting on a bench reading. The idea was to have these figures lit up at night by admirers of this work. The power cable had to be installed from the next road lantern over a length of 50 m. The ideal task for the GRUNDODRILL 4X, which accomplished the mission in only half of a working day.

Performance data

Max. thrust and pulling force:	43 kN	Pilot bore Ø:	58 mm
Torque:	1300 Nm at 230 rpm	Pipe-Outer Ø:	≤ 160 mm
Drill rods:	45 each 1525 mm	Bore length:	100 m
Smallest bending radius:	25 m	Weight:	1845 kg

Apollo – world-wide the strongest and largest pneumatically operated rammer



The ramming technology of TRACTO-TECHNIK is unbeatable. The Apollo Rammer is the largest pneumatically operated rammer world-wide, with its 40.000 Nm impact energy and 11,5 t total weight, it is able to drive steel pipes with up to 4 m diameter into the ground.

The TT-rammers are applied for pipelines, the production of pipe screens and subways, vertically for laying foundations and sheet-piling. They are also becoming more commonly used in the HDD large bore rig field, to strike jammed drill rods free from the ground.