INSPIRING TRENCHLESS TECHNOLOGIES

TRACTO-TECHNIK

RAM THE DRIVING FORCE

GRUNDORAM
Steel pipe rammer

FULL SPEED AHEAD

For dynamic pipe installation

STEEL PIPE INSTALLATION WITH GRUNDORAM

GRUNDORAM pneumatically driven pipe ramming machines are used for the dynamic installation of **pipelines beneath roads, railway embankments and rivers**. These machines, which provide **thrust forces up to 40,000 kN (4,000 t),** enable the economic installation of open steel pipes as casing or product **pipes up to 4,000 mm diameter**, over lengths up to 80 m, in soil classes 1–5 (partly even class 6 – easily soluble rock) without the need for jacking abutments.

The GRUNDORAM machine technology is **extremely robust, load-resistant and reliable.** It is a suitable technique for installing horizontal and helically welded pipes, seamless pipes and pipes with insulation protection. It can be used for **various applications** in all kinds of soil types with the exception of muddy areas, swamps and compact, non-displaceable soils.

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 tunnel construction. The ramming technique can be used for supporting HDD operations (HDD-assist) or working vertically, for example when laying foundations.

The dynamic ramming impact shatters obstacles and easily overcomes difficult starting resistance after periods of inactivity. Target precision is achieved because the dynamic impact punches through the ground, destroying obstacles so they need not be displaced in one piece and shoved rammed forward. The dynamic ramming impact shatters obstacles and easily overcomes difficult starting resistance after standstill periods.

The technical and economical advantages of the ramming method result from the fact that abutments (in the rear, front or underneath) are not required, thus shortening the set-up times.

This technique also ensures that the pipe string is stably embedded in the ground as the structure of the surrounding soil is not loosened; this also makes pipe installation in water-bearing and rocky soils possible. Due to its very small displacement volume in the area around the cutting shoe, ground heave can be ruled out even when there is little ground cover.

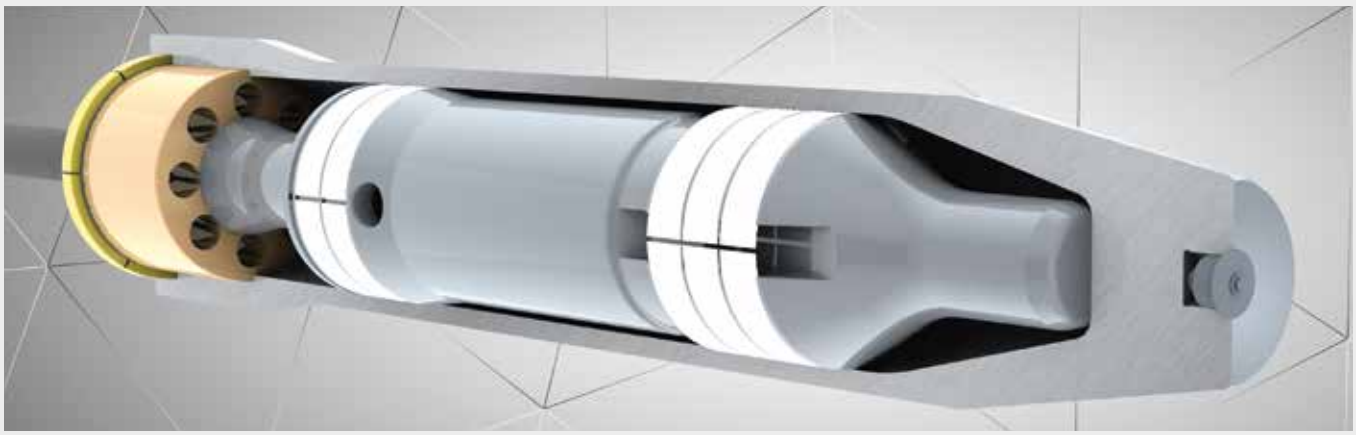
Simple operation –
compressed air on/off,
no additional control

Housing is chromium-plated
inside – for long lasting
maximum efficiency

Front and
rear cone

SMASHING
Load resistant and reliable

ALWAYS STRAIGHT AHEAD UNDERNEATH



The massive piston is bedded on several slider belts which prevent the material-wearing friction of metal on metal. Sealing rings minimise air consumption and increase performance, thus leading to greater efficiency – the rate of advance is raised accordingly.

Elastically mounted control –
minimal wear despite the
application of extreme loads

Versatile accessories
available

Solid housing **in one part –**
heavy-duty without seams
or screwed fittings

Greatest ramming impact
for **high rate of progression**

Short versions available
for special applications
and operation within
confined spaces

WITHOUT SCREWED CONNECTION

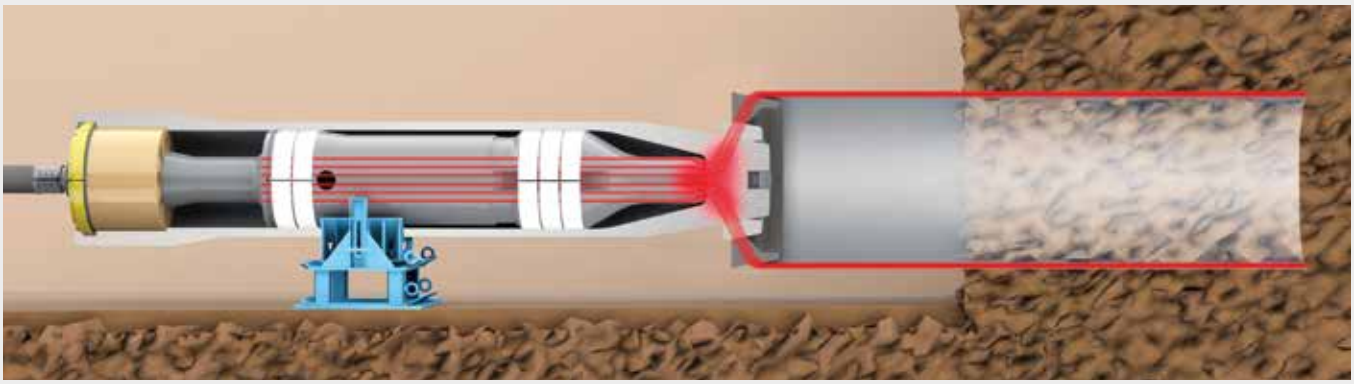
The TT pipe rammers are the only ramming machines which can abandon threaded connections which are normally common practice. The connection hose is exchanged quickly, simply and problem-free without swaging.

FORGED FROM ONE PIECE

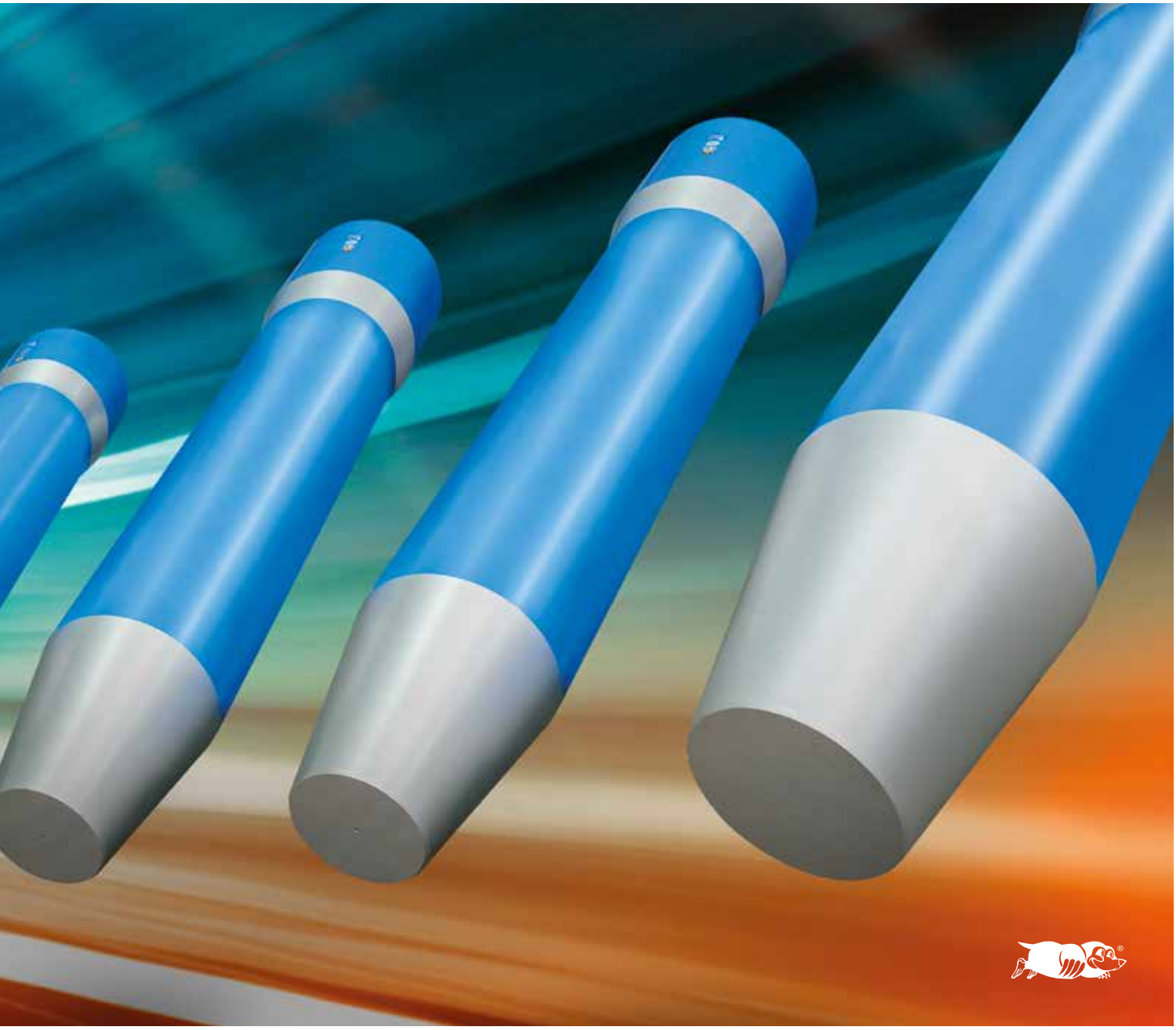
The massive housing consists of only one piece, manufactured from a single forged part and then galvanised. Due to precise deep hole boring, the piston impact makes its way to the head of the ramming machine, effectuating direct force transmission.

13 STRONG TYPES
For pipe installation

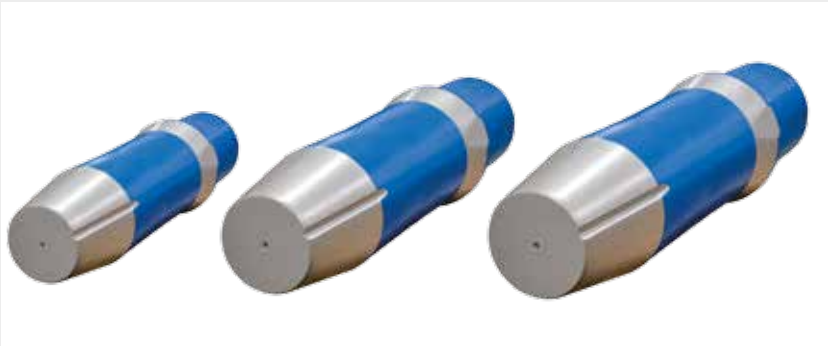
Functioning principle GRUNDORAM



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



GRUNDORAM Mini machines



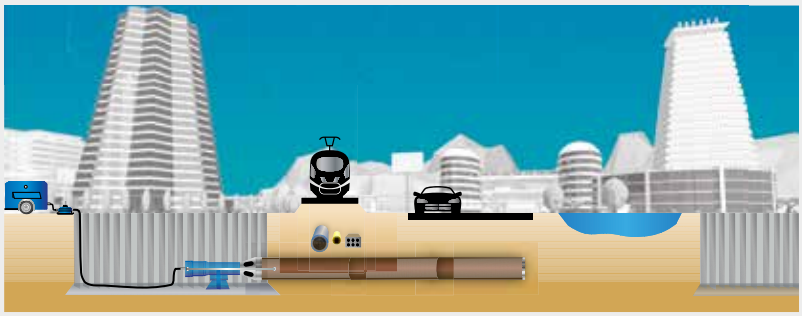
The short and highly efficient mini machines are ideal for propulsion in the pipe; they are the optimal choice for working in narrow and inaccessible places.

ALWAYS TAKE THE STRAIGHT LINE UNDERNEATH

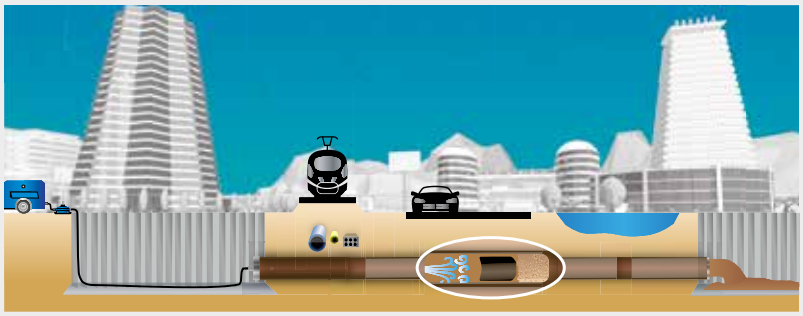
Application

UNDERCROSSINGS
Pneumatically driven pipe ramming with GRUNDORAM uses steel pipes up to Ø 4,000 mm under roads, railway tracks, buildings and rivers in lengths up to 80 m.

1. PIPE DRIVING
The ramming machine is connected to the jacking pipe with shearing strength by means of an attachable taper before it is aligned axially behind the pipe with the aid of the support cushion. Thanks to the soil removal adapter or taper, the soil inside the pipe can partially escape while the pipe is being driven forward.



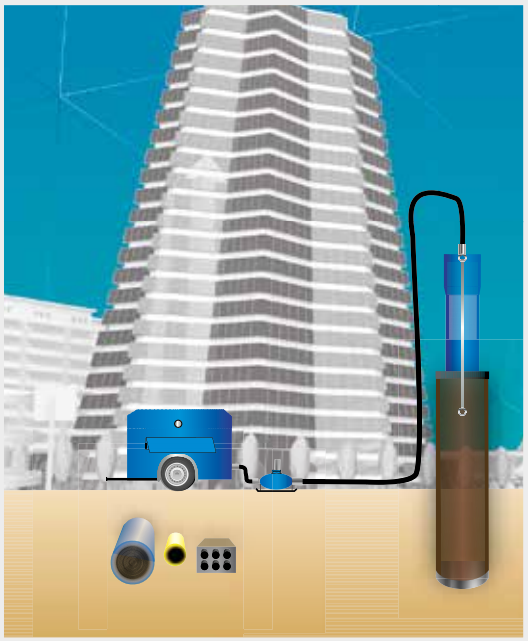
2. PIPE EVACUATION
The soil which is taken up by the open pipe during the ramming process is finally expelled into the target pit using compressed air and/or water.



ALTERNATIVE APPLICATIONS

VERTICAL APPLICATION

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



- **Foundations and pile foundations**
  For overhead signs, noise barriers, building securities etc.
- **Well construction**
  Vertical steel pipe driving for building installing a well. Emptying with round grippers.
- **Ramming in sheeting walls**
  Steel sheet piles or double T-beams for securing construction pits etc.

HDD-ASSIST

The steel pipe ramming machines are excellent for completing complicated HDD operations successfully.

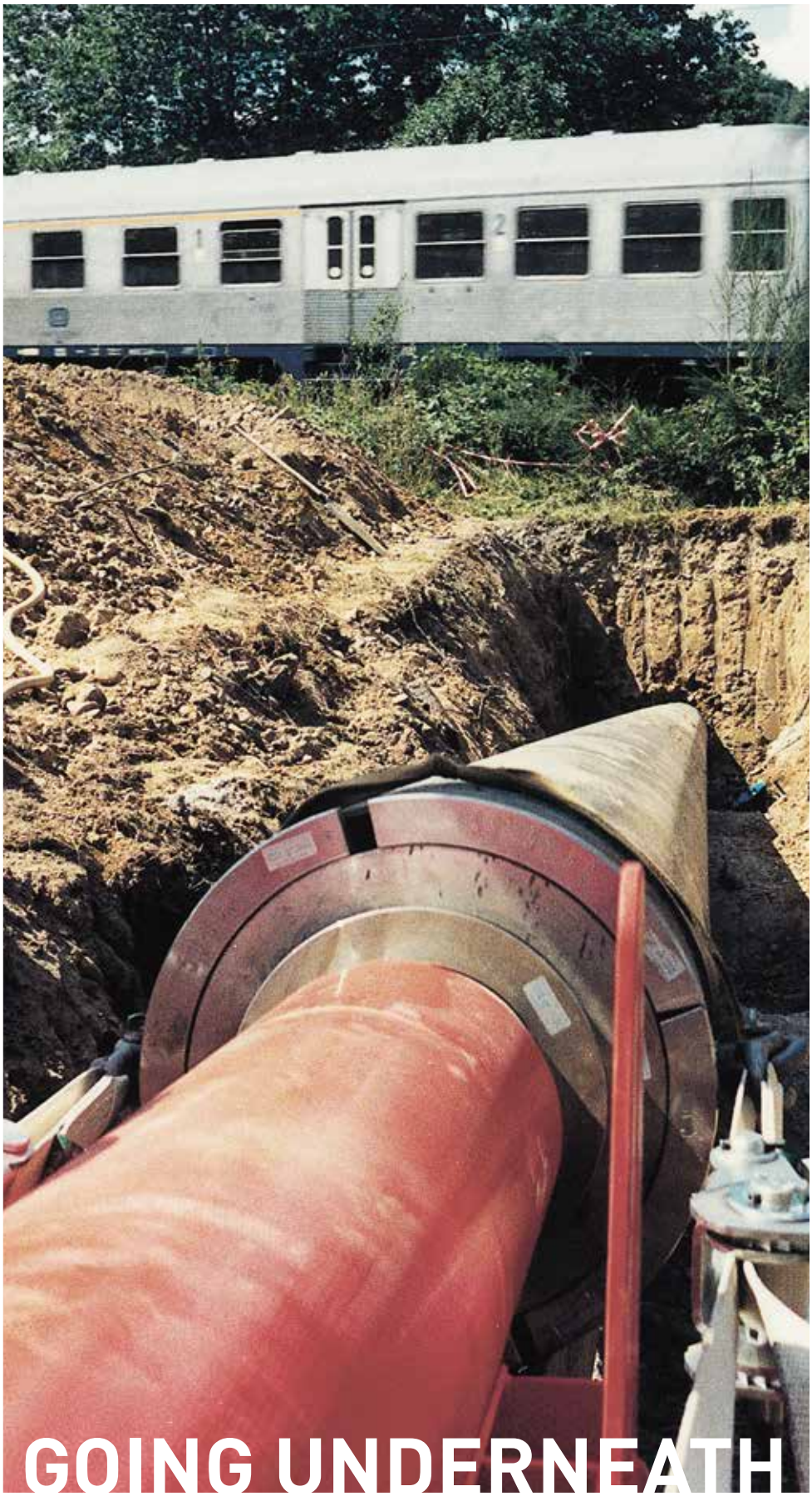
- **Conductor Barrel**
  In soils which are impossible to bore through, a steel pipe is rammed through the relevant soil layer, the fluid-assisted horizontal drilling operation can commence then.
- **Pull-Back Assist**
  When pulling in steel pipes for HDD, the GRUNDORAM can give dynamic support or release pipes if they become jammed. The ramming machine is connected to the steel pipe in the rear to allow the application of impact energy, synchronised with the pulling speed.
- **HDD Rod Recovery**
  Pulling out trapped drill rods with the aid of an adapter and dynamic ramming force
- **Bore Salvage**
  Retrieving jammed product casing pipes after the HDD operation.

HDD-ASSIST

POWERFUL

TUNNEL BUILDING

VERTICAL



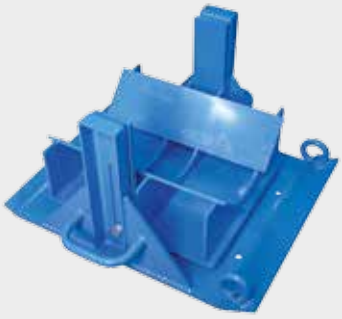
GOING UNDERNEATH

ACCESSORIES
For all applications

ATTACHABLE TAPER
Using attachable taper-lock ram cones, with shearing strength the GRUNDORAM is connected to the pipe that is to be installed.

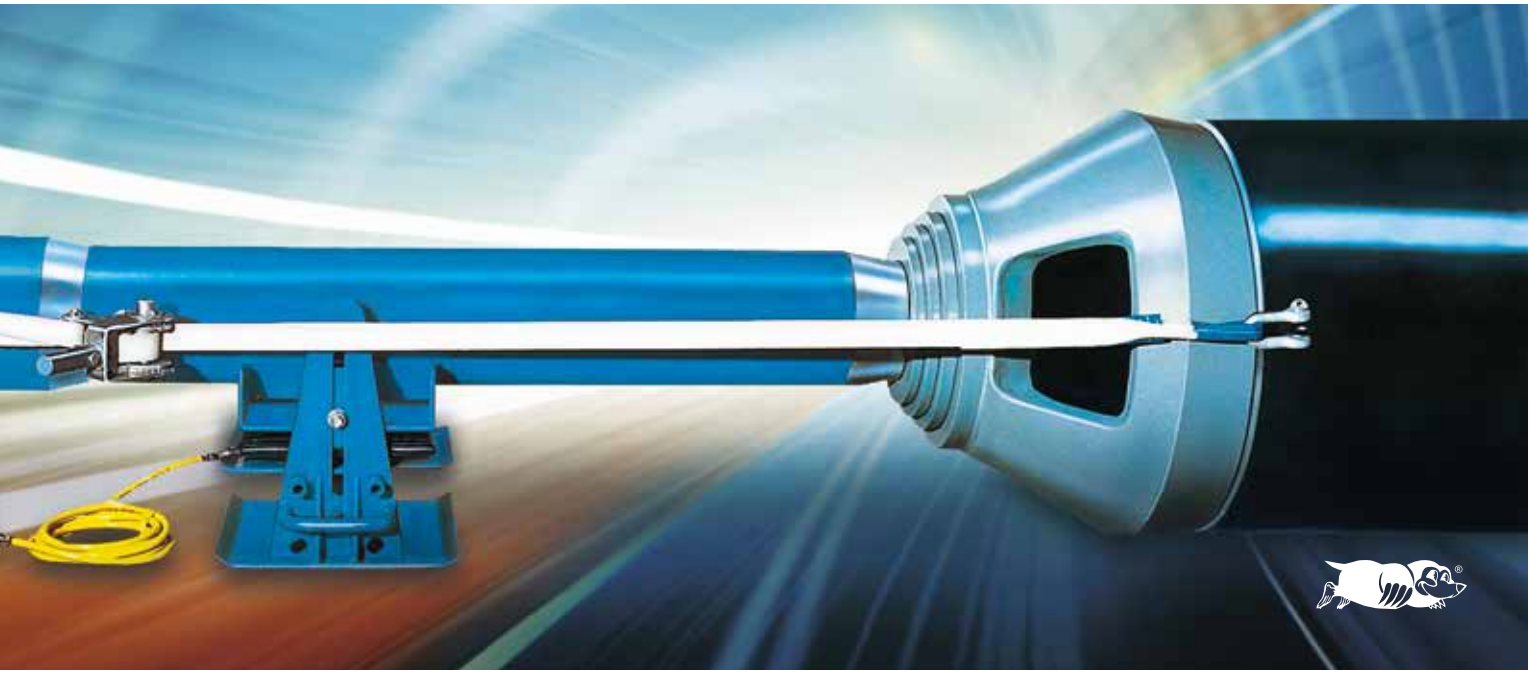
COTTER SEGMENTS
The multi-part impact segments prevent pipe end flare and improves the optimal induction of impact power.

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.



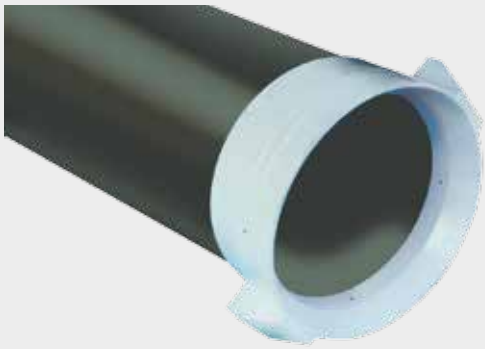
LAUNCHING CRADLE WITH SUPPORT CUSHION
With the support cushion positioned inside the launch cradle, the heavy ramming machines can be lifted and lowered without effort. Available in 4 types all with adequate lifting force.

THE 7 L OIL LUBRICATOR
This is built in between the compressor and the machine to enable lubrication of the internal piston.



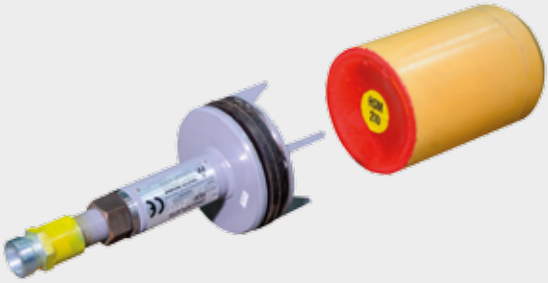
CUTTING SHOES

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



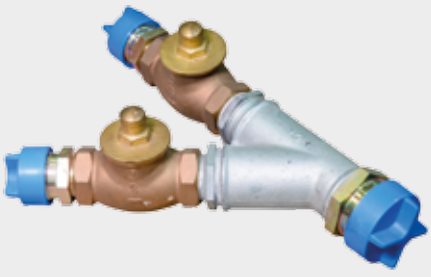
LUBRICATING CUTTING SHOES

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



CONNECTION DISTRIBUTORS

For connecting the compressed air hoses, when working with several compressors simultaneously. Non-return valves prevent pressure kickback.



PRESSURE PLATE WITH RIGID FOAM PIG

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 pig may be necessary to seal the front.

Further accessories are available upon request.

ACHIEVEMENT-ORIENTATED

Technical specifications

GRUNDORAM Standard machines

DAVID

ATLAS

TITAN

OLYMP

HERKULES

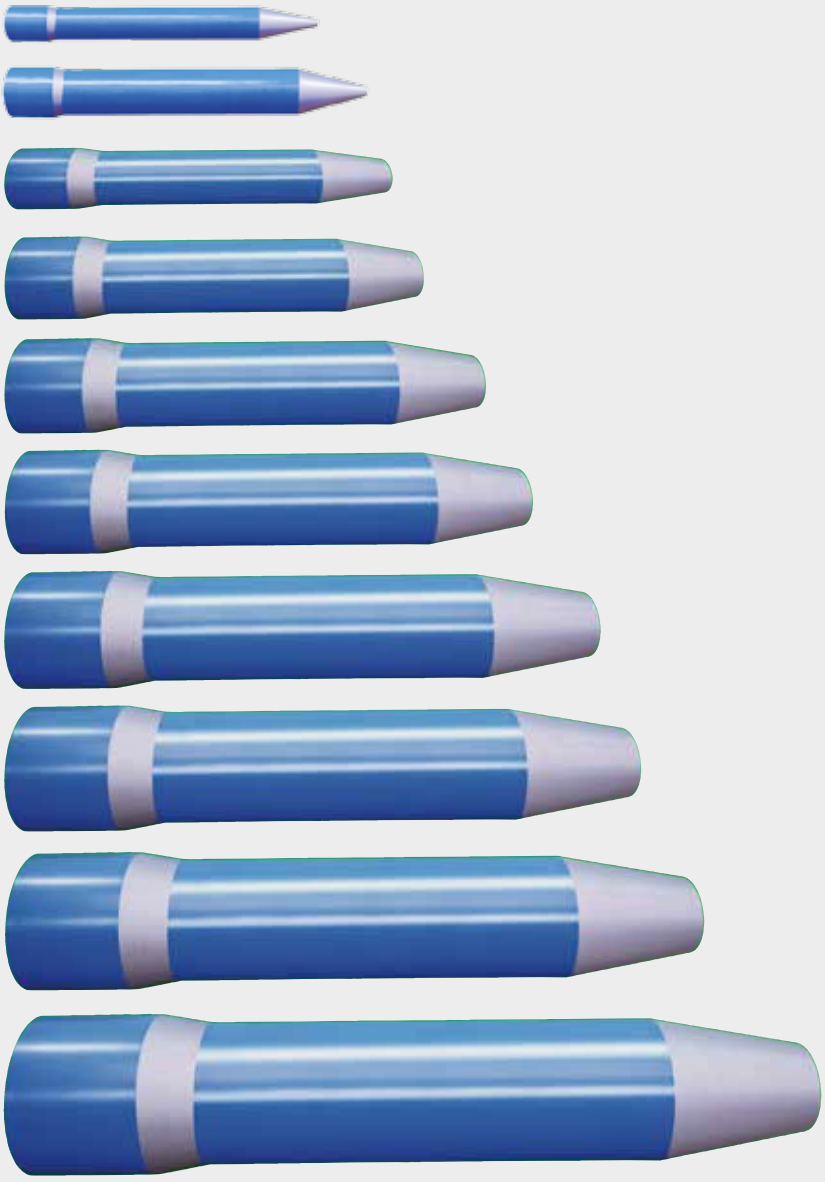
GIGANT

KOLOSS

GOLIATH

TAURUS

APOLLO



GRUNDORAM Mini machines

MINI-ATLAS

MINI-OLYMP

MINI-GIGANT

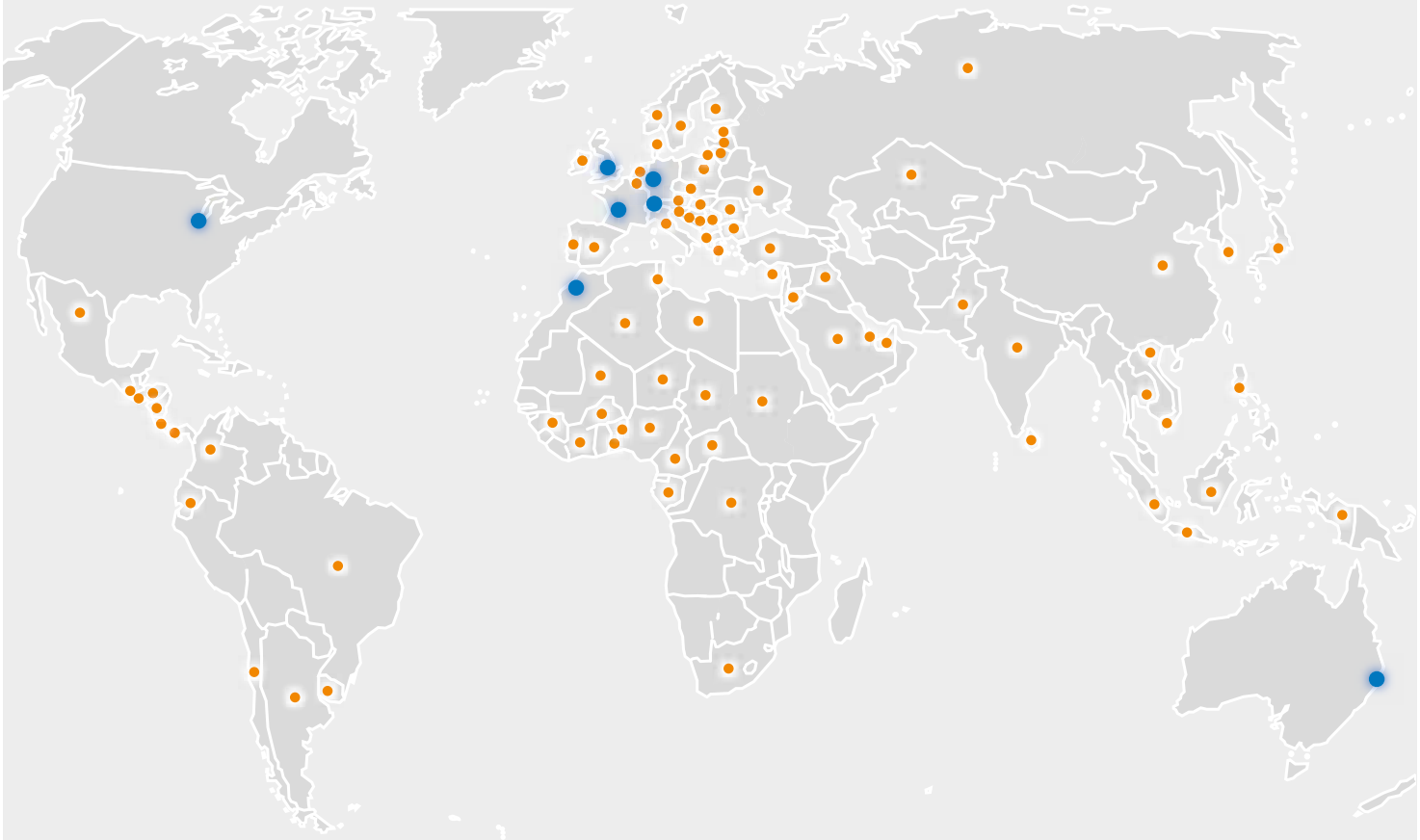
GRUNDORAM-TYPE	MINI ATLAS	MINI OLYMP	MINI GIGANT
Machine Ø (mm)	125	180	270
Rear cone Ø (mm)	140	230	330
Length (mm)	946	1,080	1,230
Installation pipe in pipe (mm)	250	450	450
Weight (kg)	60	175	460
Air consumption (m^3/min)	1.7	3.5	10.0
No. of strokes (min^{-1})	580	500	430
Impact energy (Nm)	180	720	2,000
From pipe DN on	50	100	200

Technical data

GRUNDORAM-TYPE	DAVID	ATLAS	TITAN	OLYMP	HERKULES	GIGANT	KOLOSS	GOLIATH	TAURUS	APOLLO
Machine Ø (mm)	95	130	145	180	216	270	350	460	600	800
Rear cone Ø (mm)	112	145	160	195	235	300	400	510	670	900
Length (mm)	1,490	1,453	1,545	1,690	1,913	2,010	2,341	2,852	3,645	4,400
Weight (kg)	59	95	137	230	368	615	1,180	2,465	4,800	11,500
Air consumption (m^3/min)	1.2	2.7	4.0	4.5	6.5	12.0	20.0	35.0	50.0	100
No. of strokes (min^{-1})	345	320	310	280	340	310	220	180	180	180
Impact energy (Nm)	230	420	800	890	1,440	2,860	6,820	11,600	18,600	40,500
From pipe DN on	50	50	100	100	120	200	280	380	380	600

All statements without guarantee

TRACTO-TECHNIK
worldwide



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