

Auger Boring Machines
Pipe Bursting Systems
Kobus Renewal Technology
Vertical Auger Drives

PERFORATOR
PERFORMANCE DRILLING



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Horizontal Drilling Technology

- Auger Boring machines & accessories
- Pipe bursting systems
- KOBUS Pipe Puller and accessories
- Vertical augers

Drill Pipes and Drilling Tools

- Drill pipes and accessories for DTH, and Rotary drilling
- Drill pipes and accessories for RC drilling
- Augers, bore heads and cutting tools
- Drill pipes for HDD drilling
- Drill pipes for oil and gas field
- Casings

2-Component Injection Pumps

- Electronic pumps
- Pneumatic piston pumps
- Pneumatic gear pumps
- Flowmeters

Disc Cutters

- Standard or customized disc cutters
- From 6" to 15,5" (150mm – 395mm)

Our Company

For over 30 years PERFORATOR has been supplying a wide range of horizontal and vertical drilling technologies. The company's core competences are auger drilling technology, drill pipes and accessories, disc cutters and injection technology.

We know how crucial it is to offer a comprehensive range of applications for every project. Our complete systems consist of largely compatible and interchangeable components that are precisely matched to each other. Precise, flexible, individual and cost-efficient. And always with comprehensive services.

Do you have special requests or very specific challenges? With us, you have top priority. The focus is on personal advice and support in order to build a long-lasting, satisfying business relationship.

Flat hierarchies, lean structures, highly qualified employees and efficient management contribute to our success.

A strong community

Our success story begins with the core business of the former Schmidt, Kranz GmbH. Since the 19th century, this company began with the development of mining and tunnel boring systems. Today PERFORATOR combines these proven traditions with continuous innovation and produces a wide range of high-quality products. The cooperation within our international group of companies, Schmidt Kranz Group, creates valuable synergy effects - an advantage that we pass on directly to our clients.



Our history

Our success story begins with the more than 100-years tradition of Schmidt, Kranz & Co. GmbH, a family-owned holding company that began designing mining and tunnelling systems since the 19th century. Today PERFORATOR builds on this long-standing experience and expertise, combining proven traditions with continuous innovations and the development of ever more efficient solutions.



1885

Establishment of the Schmidt, Kranz & Co. GmbH Nordhäuser Maschinenfabrik. The company gains some importance as a supplier to the Central German potash mining industry. Production facilities and administration buildings are built in Nordhausen's Ullrichstraße.

1903

The iron miner 1903 a technical revolution



1922

The company passes into the ownership of Prof. Dr. Karl Glinz. Due to a sales crisis in potash mining industry, Schmidt, Kranz expands its product range to include processing plants and hydraulic engineering equipment based on patents by Prof. Glinz. At the beginning of the 1930s, the NORMAG small tractor is successfully added to the product range.



1945

NORMAG Zorge GmbH is founded in December. Under the management of Mrs. Cäcilie Glinz and Dr. Hans-Karl Glinz, the production of spare parts for tractors and mining machinery is started. At the end of the 1940s, the market for tractors expands and the branch in Zorge becomes a supplier for the production relocated to Hattingen/ Ruhr.



1970/72/74

Expansion of the Zorge plant. Development and inclusion of high-pressure hydraulics, Tigrip-load handling attachments and Airator-air cleaning equipment in the manufacturing and delivery programme.



1980

Relocation of the mining programme to the newly built plant in Walkenried, later the headquarters of PERFORATOR GmbH.

Our history

AUGER BORING MACHINES: Our Passion!



As part of German reunification, the former Nordhausen plant in Ulrichstrasse is reacquired.

1991



1984/89

Expansion of the Walkenried site. With the exception of the hydraulics programme, all product lines are manufactured here.

1993

Introduction of the PERFORATOR auger boring technology programme.

2002

Transfer of the PERFORATOR Drilling Technology and MAXIMATOR High Pressure Technology divisions into independent companies under the roof of the Schmidt, Kranz Holding. The group of companies, which still has its headquarters in Velbert/Langenberg, is managed by the Glinz family under the leadership of Dr. Caspar Glinz. The production areas of auger drilling technology, oilfield drill pipes according to API standards, auger boring bars, mining machines and the anchor programme remain with PERFORATOR GmbH in Walkenried.

2004

Establishment and integration of mts PERFORATOR GmbH Microtunnelling Systems based in Valluhn. Competences in the field of tunnelling technologies and the human capital largely result from the former LOVAT mts tunneling systems.



2007/08

New factory work floor construction and expansion of production capacities at PERFORATOR GmbH in Walkenried

2021

In order to focus on the core business, mts PERFORATOR GmbH splitted into the two independent companies PERFORATOR GmbH and MTS Microtunnelling Systems.

2021

PERFORATOR develops the first fully automated friction welding machine for drill pipes. As a result, drilling equipment specialist PERFORATOR produces consistently high quality and, thanks to short set-up times, is able to respond flexibly to market requirements and individual customer wishes.

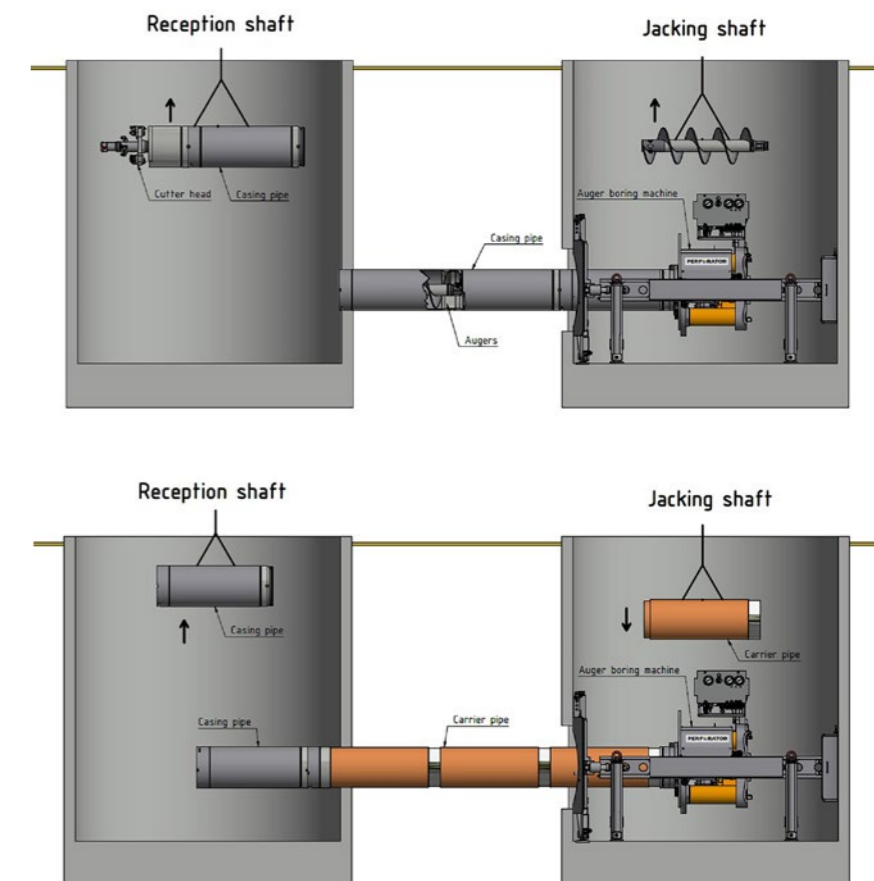


PERFORATOR offers you a wide range in the field of trenchless technologies. Our primary goal is to reconcile the wishes of our customers with the requirements of nature and the environment. Our auger drilling rigs, pipe bursting rigs and vertical earth drills are used every day all over the world and ensure precise work with maximum efficiency. In addition to our product range, you receive comprehensive services from our expert staff.

You receive a tailor-made solution for your drilling project. Supplementary product information and procedures can be found on our website www.perforator.de, while competent contact persons are available to you in our worldwide subsidiaries. We will be happy to advise you.

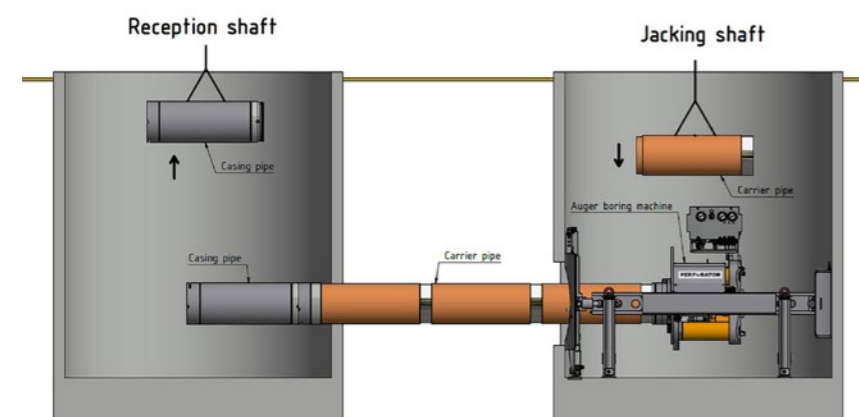
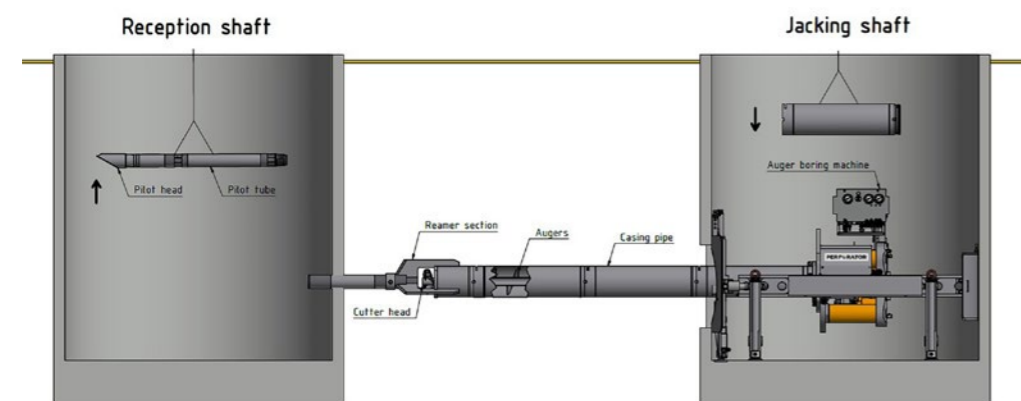
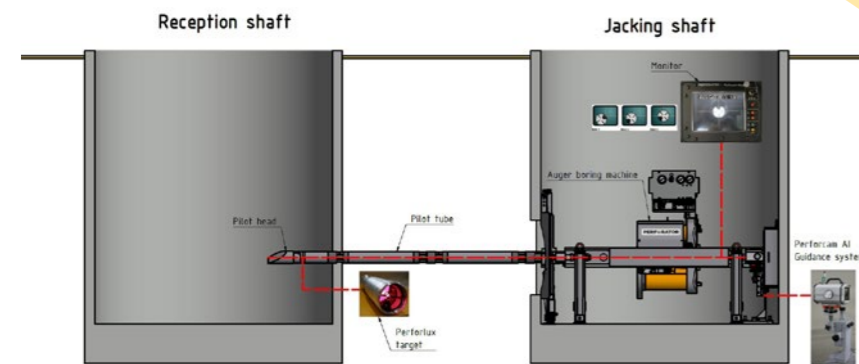
Unguided auger boring

In the unguided auger drilling process, a steel pipe (drill pipe or casing pipe) is pushed forward with the aid of an auger boring rig. The direction and tilt are taken into account when aligning the drilling rig. The drilled material is extracted using a drill head and an auger. The steel casing pipe remains in the ground, while recoverable drill pipes are pressed out with the carrier pipe in a further work step. The method is used for both unconsolidated rock and solid rock. The choice of drill head depends on the sub-soil conditions. In the case of solid rock and non-cohesive unconsolidated rock, down-the-hole hammers are also used.



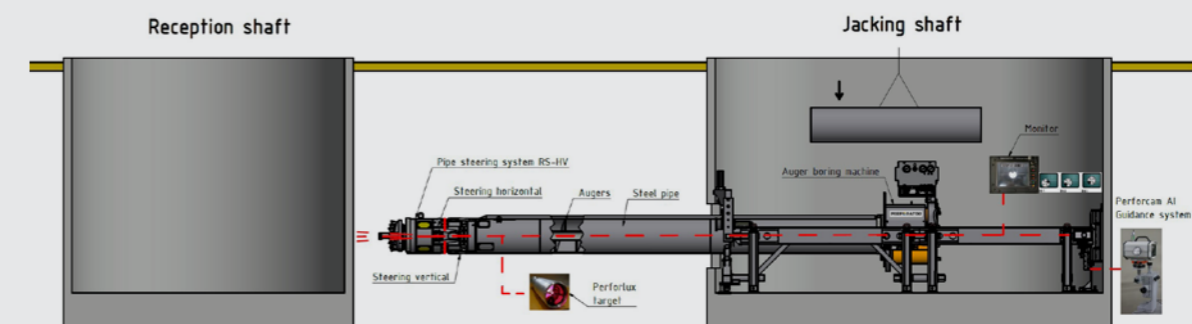
Guided auger boring – pilot tube method with soil displacement

In this process a string of pilot tubes is installed by displacing the ground with a steering head complete with target. The surveying and control are carried out using an optical-electronic navigation system. The system consists of the optical aiming device, a digital camera unit and a monitor. Directional changes are carried out by control surfaces of the control head using the reaction force of the foundation soil. Subsequently, casing or product pipes of the same or larger outer diameter are driven while simultaneously pressing out the pilot tubes. Larger outer diameters require widening by soil removal in one or more operations.



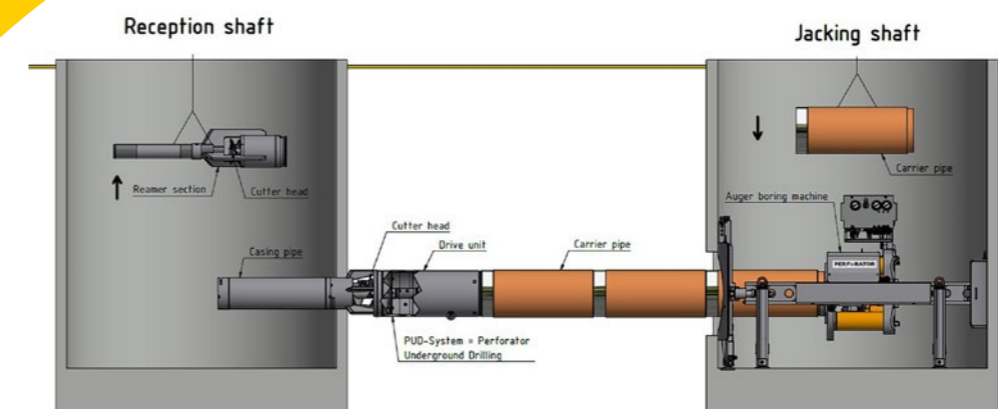
Guided auger boring – pilot tube method with soil removal

In this method, the pilot tube string (casing pipe) is driven by removing the soil. As with pilot tube jacking with soil displacement, surveying and control is carried out with an optical-electronic navigation system. Directional changes are carried out by a steerable drill head (pipe control). Pipe control systems make it possible to lay casing pipes with diameters of 406–1.420 mm in unconsolidated and solid rock, controlled in just one work step. Product pipes of the same outer diameter are driven while the casing pipes are pressed out at the same time.



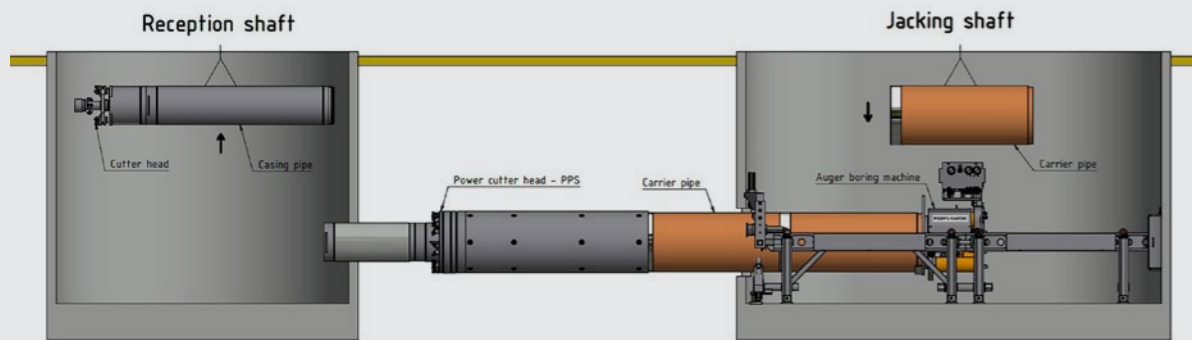
Pilot pipe jacking with microtunnelling

The process variant combines the classic pilot tube jacking methods with directly driven powered reaming heads (PUD) or powered cutting heads (PPS). The driven reaming heads or cutting heads are connected to casing pipes that are already laid (steel pipes or temporary casing pipes) with internal auger. The product pipes are then connected to the PUD or PPS and pressed in. At the same time, the drilling material is transported into the target pit by means of augers. PUDs are used for unconsolidated rock (easily displaceable soils) up to a product pipe diameter of 1.200 mm, PPS can be used up to solid rock and a product pipe diameter of 1.520 mm.



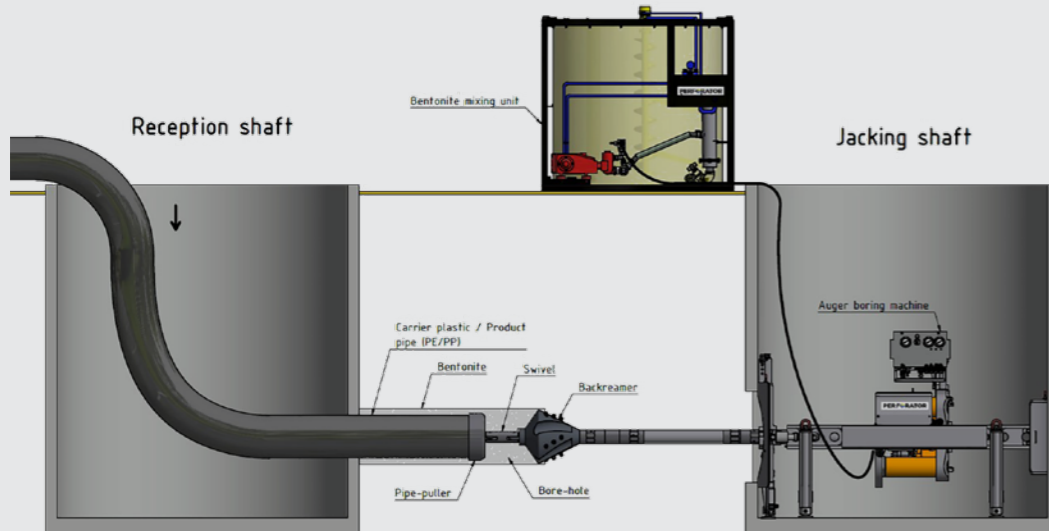
AUGER BORING MACHINES: Our Passion!

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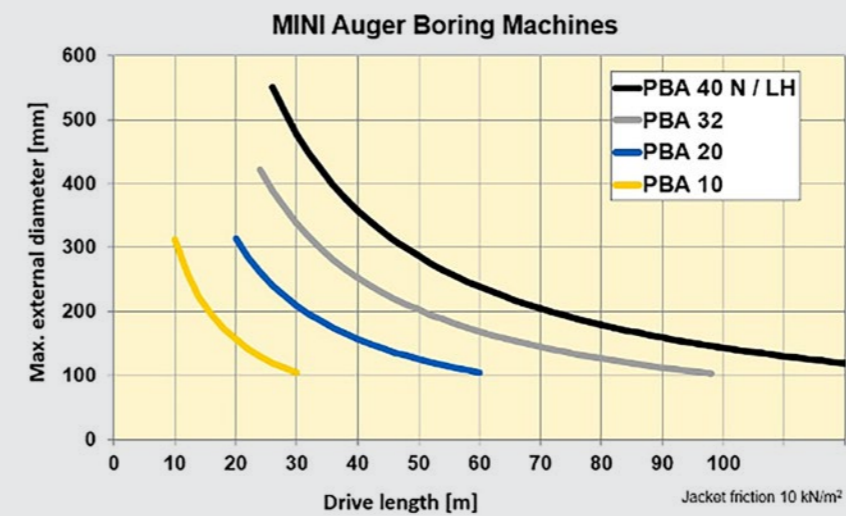
HDD (Horizontal Directional Drilling) method as pilot tube jacking with soil displacement

HDD (Horizontal Directional Drilling) method as pilot pipe tube jacking with soil displacement. In this process a string of pilot tubes is installed by displacing the ground with a steering head complete with target. In the case of unconsolidated rock drilling, the soil is extracted hydromechanically with high-pressure nozzles on the drill head and, at the same time, mechanically with cutting elements on the drill head (control head). Surveying and control is carried out with an optical-electronic navigation system, which guarantees the highest degree of positional accuracy. In the HDD process variant, gravity pipes made of polyethylene (PE) can therefore also be laid. The product pipe is laid using the pull-back method with backreamer and bentonite.



Mini auger boring machines forced of 100–400 kN for pipes up to an outer diameter of 550 mm.

These compact auger drilling rigs are used for trenchless installation of all types of house connections. No matter whether it is gas, water or sewage pipes or protective pipes for telecommunication or electricity cables. The compact design and simple construction allow you to work from basements, collection shafts, circular shafts and hard-to-reach excavation pits. With the help of extension frames, the auger drilling rigs in the Mini series can be adapted to the length of the pipes to be laid. With the pilot tube method, the boreholes achieve the highest accuracies required for gravity pipelines.



Mini-Machines	PBA	10	20	32	40N	40LH
Jacking shaft	[m]	L=2.0	L=2.0 Ø=2.0	L=2.0	L=2.0 Ø=2.0	L=2.0
Thrust force	[kN]	98	192	318	385	385
Pullback force	[kN]	63	130	177	259	259
Piston stroke	[mm]	266	240	235	425	625
Max. torque	[Nm]	2.300	5.700	5.700	8.700	8.700
Max. spindle speed	U/min]	74	59	59	47	47
Height of machine axis	[mm]	270	340	365	635	635
Auger connector	[mm]	SW 41	SW 41	SW 41	SW 50/60	SW 50/60
Max. pipe OD*	[mm]	324	324	419	550	550
Max. pipe length basic frame	[mm]	1.000	1.000	1.000	1.000	750 (1.000)
Length	[mm]	1960	1.920	1.940	1.950	1.954
Width	[mm]	880	895	951	868	868
Weight	[kg]	250	480	535	1.040	1.100
Power pack	[-]	HS-1.19D/ HS-1E	HS-1.19D/ HS-1E	HS-1.19D/ HS-1E	HS-1.37D/ HS-1E	HS-1.37D/ HS-1E

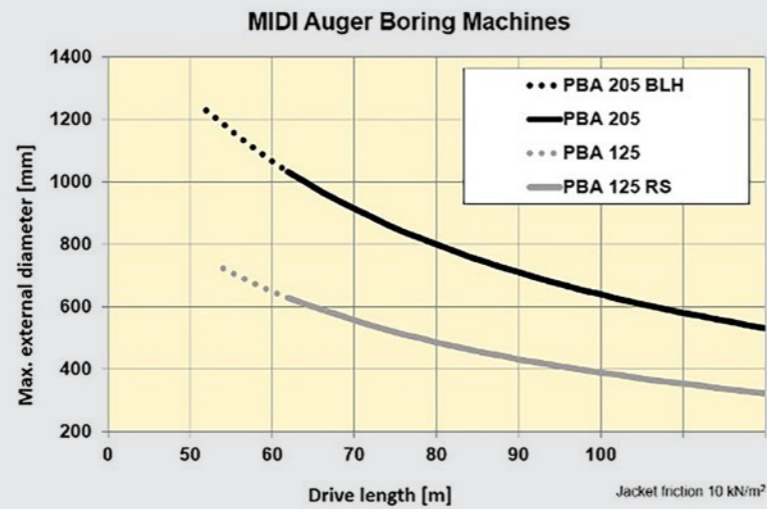
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AUGER BORING MACHINES: Our Passion!

Midi auger boring machines forced of 1.250–2.050 kN for pipes up to an outer diameter of 1.260 mm.

The compact design allows the use with 1 m drilling tools and pipes in small excavations or circular shafts. The PBA 125 RS press drilling rig has been designed for drilling from 2 m diameter circular shafts. For use with longer drilling tools and pipes, this Midi class can be extended to the required size using extension frames. Some machine types are available as an LH version with extended press cylinders for increased advance speed. The application range of the press drilling rigs extends up to a maximum jacking length of over 100 m and serves all requirements of the most varied subsoil conditions. In displaceable soils, the pilot tube method is generally used; in heavy soils or rock, pipe control systems with or without hammer systems are used. The Midi class is suitable for the installation of steel protection pipes, temporary casing pipes, concrete, vitrified clay and GRP jacking pipes.



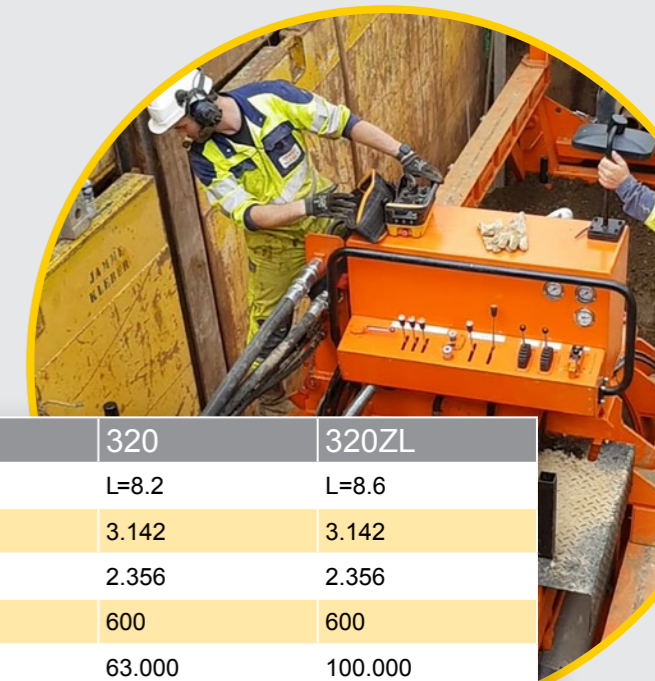
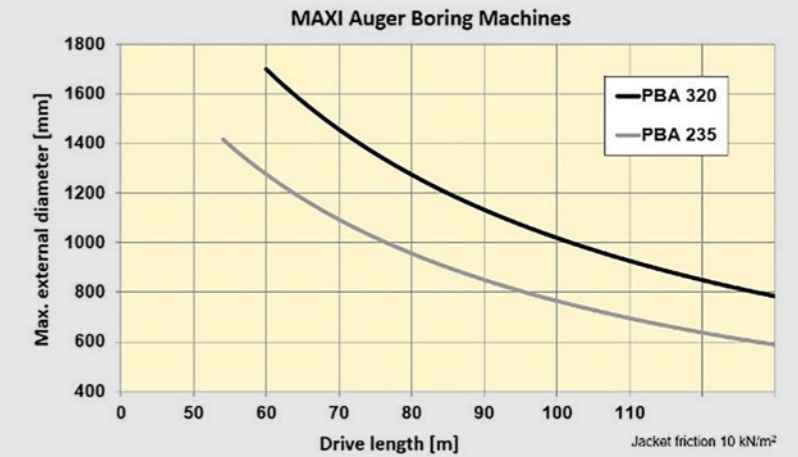
Midi-Machines	PBA 125	125RS	125LH	205 RS	205LH	205BLH
Jacking shaft	[m] L=2.5	L=2.0 Ø=2.0	L=2.5	L=3.2 Ø=3.2	L=2.0 + pipe	L=3.7
Thrust force	[kN] 1.227	1.227	1.227	2.011	2.011	2.011
Pullback force	[kN] 944	944	944	1.060	1.060	1.060
Piston stroke	[mm] 380	380	730	450	880	1.210
Max. torque	[Nm] 18.000	18.000	18.000	43.000	43.000	43.000
Max. spindle speed	[U/min] 52	52	52	29	29	29
Height of machine axis	[mm] 677	677	677	1.062	865	962
Auger connector	[mm] SW 76	SW 76	SW 76	SW 90	SW 90	SW 90
Max. pipe OD*	[mm] 630	630	711	960 (1.050)	1.050	1.220
Max. pipe length basic frame	[mm] 1.000	1.000	1.000	2.000	0	1.000
Length	[mm] 2.455	1.960	2.475	3.100	1.820	3.463
Width	[mm] 1.330	1.330	1.330	1.892	1.870	2.070
Weight	[kg] 1.850	1.800	2.140	4.580	5.350	5.850
Power pack	[-] HS-2D/ HS-2E	HS-2D/ HS-2E	HS-2D/ HS-2E	HS-3D/ HS-3E	HS-3D/ HS-3E	HS-3D/ HS-3E

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AUGER BORING MACHINES: Our Passion!

Maxi auger boring machines forced of 2.350–3.200 kN for pipes up to an outer diameter of 1.720 mm.

These robust and powerful auger drilling rigs are designed for pipeline construction. They are mainly used for railway, river or motorway crossings or in pipeline construction. The Maxi class is suitable for the installation of steel protection pipes, reusable temporary casing pipes, concrete, vitrified clay and GRP jacking pipes. Designed for the toughest applications, with impressive jacking forces and high torques of up to 100,000 Nm, the Maxi machines enable drilling tasks in the most difficult ground conditions. With extension frames, the auger drilling rigs can be extended to various pipe lengths in order to use tools and pipes with a length of more than 3 m. Drilling lengths of up to 130 m and pipe diameters of up to 1.720 mm are possible depending on the application and drilling method.



Maxi-Machines	PBA 235	235Z	320	320ZL
Jacking shaft	[m] L=6.0	L=8.0	L=8.2	L=8.6
Thrust force	[kN] 2.327	2.327	3.142	3.142
Pullback force	[kN] 1.693	1.693	2.356	2.356
Piston stroke	[mm] 600	600	600	600
Max. torque	[Nm] 63.000	100.000	63.000	100.000
Max. spindle speed	[U/min] 32	22	32	22
Height of machine axis	[mm] 950	950	1.220	1.220
Auger connector	[mm] HEX 120	HEX 120	HEX 120	HEX 120
Max. pipe OD*	[mm] 1.420	1.420	1.720	1.720
Max. pipe length basic frame	[mm] 2.000	3.000	3.000	3.000
Length	[mm] 5.525	7.525	7.780	8.100
Width	[mm] 1.975	1.975	2.419	2.419
Weight	[kg] 6.100/2.400	6.600/3.300	7.600/5.100	8.000/5.200
Power pack	[-] HS-3D HS-3E	HS-3D HS-3E	HS-3D HS-3E	HS-3D HS-3E

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Hydraulic power units

The efficient, powerful and compact hydraulic power units of the HS series are specially designed to meet the requirements of auger drilling rigs. Their simple handling, the modern, power-controlled and durable drive technology guarantee smooth operation of the machines. All units in the HS series are soundproofed and comply with the applicable emission limits (US, EU) and safety standards. The electric hydraulic units in particular define a new ecological standard – almost emission-free (exhaust gases, noise). The diesel or electric power units of the HS series for the Midi and Maxi auger drilling rigs have a 3 or 4-circuit hydraulic system. This provides the user with the highest performance in thrust, pull, speed and torque in all drilling situations. The 3rd or 4th circuit is provided for the operation of a bentonite mixing and pumping station, the entire operation is carried out via only one hydraulic unit.

Hydraulic power packs	HS	1.19D	1.37D	2D	3D	1E	2E	3E
Type of Engine	[-]	Diesel/ YAN- MAR	Diesel/ YAN- MAR	Diesel/ JOHN DEERE	Diesel/ JOHN DEERE	Electric/ VEM	Electric/ VEM	Electric/ IE
Emission standard	[-]	EU Stage V	EU Stage V	EU Stage V	EU Stage V	-	-	-
Power	[kW]	19	37	100	187	30	90	130/15
Type of pump	[-]	LS*	LS*	LS*/KP**	LS*/KP**	LS*	LS*/KP**	LS*/KP**
Pressure max.	[bar]	250	310	330	330	330	330	330
Oil tank capacity	[l]	130	150	340	340	80	370	340
Fuel tank capacity	[l]	30	80	200	200	-	-	-
AdBlue tank capacity	[l]	-	-	20	20	-	-	-
Power pump 1	[l/min]/ [bar]	50/250*	150/310*	165/210*	225/210*	80/330*	168/210*	210/210*
Power pump 2	[l/min]/ [bar]	-	-	82/330*	165/210*	-	68/330*	168/210*
Power pump 3	[l/min]/ [bar]	-	-	40/180**	80/330*	-	45/180**	68/280*
Power pump 4	[l/min]/ [bar]	-	-	-	40/180**	-	-	45/180*
Length	[mm]	1.544	1.680	2.380	3.000	1.680	2.570	2.570
Width	[mm]	640	820	1.300	1.300	820	1.300	1.300
Height	[mm]	1.010	1.650	2.250	2.250	1.650	1.720	1.720
Weight***	[kg]	650	750	2.500	2.500	750	2.500	2.500
Machines	[-]	PBA 10 PBA 20 PBA 32 BMA 2000	PBA 20 PBA 32 PBA 40 BMA 2000 RBZ 60	PBA 125 PBA 205 BMA 2000	PBA 125 PBA 205 PBA 235/Z PBA 320/ ZL BMA 2000	PBA 10 PBA 20 PBA 32 PBA 40 BMA 2000 RBZ 60	PBA 125 PBA 205 BMA 2000	PBA 125 PBA 205 PBA 235/Z PBA 320/ ZL BMA 2000

Data subject to change. We do not take any liability for printed errors and/or mistakes.

* OR=Output-regulated pump

** GP=Gear pump

*** without fluids

PERFORATOR offers as well in addition to the classic diesel and electro hydraulic power units energy storage and hybrid-solutions. These concepts are individually designed and manufactured based on your needs.

Navigation system and data recording

PERFORATOR

The PERFORCAM optical-electronic navigation system is used for pilot tube jacking with and without soil removal (RS-HV pipe control). The system consists of the PERFORLUX optical aiming device, a digital camera unit with GPS receiver – PERFORCAM, a TFT monitor with data logger and a length measuring unit.

The newest version “AI” of the PERFORCAM offers an artificial intelligence for automated processes, digital recording and navigation of the pilot tube jacking.

First, the direction and tilt of the camera unit and the auger drilling rig are adjusted as required. This is controlled via the target optics inserted in the control head or initial auger of the pipe control system, which is optically detected by the camera and displayed on the monitor. The control movement or position change takes place with the pilot bore via a control bevel on the control head and, on the pipe control system, via the deflection of the front

pipe, which is also called the cutting ring. The control data stored with the data logger includes all relevant drilling parameters and is continuously recorded.

The PERFORDAT measuring and data recording unit is used to record and log the jacking length and force exerted on the pipe-line being laid. All relevant jacking data during the pipe-laying process is displayed and stored in real time. The internal display can be mirrored to your smartphone or desktop device via WiFi. The press force is determined via the pressure transmitters connected to the machine's press cylinders. The length measurement during the installation of the pipes is mapped via a measuring wheel with rotary encoder. If the permissible jacking forces are exceeded, a visual and acoustic signal is triggered. A water or bentonite pressure and flow measurement is also part of the system. The recorded measured values can be documented after the work is completed.



Pilot tubes and accessories

PERFORATOR offers two types of pilot tubes. The single-walled pilot tube for precise short bores and the double-walled tube for precise installation of the pilot tubes in long bores. The annular gap between the inner and outer pipe serves as a transport line for lubricant to reduce friction or, optionally, for compressed air to drive controllable hammer systems. The inner pipe guarantees a clear and clean optical path to the PERFORLUX optical aiming device, which is located directly behind the control head or initial auger.

The pilot pipe linkages are available in different lengths and in practical transport racks. Mechanical or hydraulically driven breaking devices allow for easy loosening of the bolted linkage connections. For simple applications, plugged pilot pipe linkages are also available. A wide range of different control heads enables optimum adaptation to the ground.



Pipe controls and accessories

The pipe controls allow for the laying of steel pipes with diameters between 406 and 1.400 mm in any subsoil, from cohesive soils and unconsolidated rock, right through to solid rock, in one operation. The horizontal (RS) and the horizontal and vertical (RS-HV) versions can be precisely controlled by means of articulated pipe sections that can be adjusted hydraulically.

Different soil conditions may require the use of special tools, such as a hammer system. Special initial augers guarantee optimal control behaviour. The control system for the RS pipe controls uses tilt sensors exclusively; the system for the RS-HV pipe controls is supplemented by the PERFORCAM optical-electronic navigation system in addition to the tilt and angle sensors. This increases the accuracy. Both RS and RS-HV pipe controls work with the PERFORDAT measuring and data recording unit and a hydraulic control unit for the pipe controls.



Pipe controls RS and RS-HV	OD [mm]	ID [mm]	Length [mm]
RS-HV 400	406	285	1.562
RS 500	508	386	1.400
RS-HV 500	508	386	1.900
RS 600	610	488	1.400
RS-HV 600	610	488	1.900
RS 700	711	580	2.000
RS-HV 700	711	580	2.500
RS 800	813	690	2.100
RS-HV 800	813	690	2.600
RS-900	914	780	2.100
RS-HV 900	914	780	2.600
RS 1000	1.016	890	2.400
RS-HV 1000	1.016	890	2.900
RS-1200	1.220	1.080	2.400
RS-HV 1200	1.220	1.080	2.900
RS 1400	1.420	1.314	3.150
RS-HV 1400	1.420	1.314	3.650

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Bentonite mixing and pumping unit

The BMA 2000 mixing and pumping unit has everything that matters. Perfect mixing, a tank volume of 2.000 l, high delivery rate and pressure. The BMA 2000 is used for pilot tube jacking and the lubrication of temporary casings and carrier pipes. An additional application is the lubrication and loosening of the excavated material directly at the drill head or auger, powered reaming had (PUD) or powered cutting head (PPS). The PERFORATOR HS hydraulic power units are equipped with an additional hydraulic circuit for the BMA 2000, which makes another power unit superfluous.

Bentonite Lubrication Units		2.000
Bentonite pump pressure	[bar]	70-80 bar
Rotation speed max	[U/min]	570
Delivery	[l/min]	30
Tank capacity	[l]	2.000
Operating pressure	[bar]	160/175
Swallowing capacity	[l/min]	45/10
Length	[mm]	1.750
Width	[mm]	1.590
Height	[mm]	2.000
Weight (without fluids)	[kg]	750

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Reaming heads

Reaming heads are the connection of pilot tube to steel pipe or temporary casing pipe. In the case of multi-stage expansion steps, the intermediate reaming head takes over the connection between the different pipe dimensions. The reaming head provides sufficient space for the drilling material to be picked up by the drill head or the auger. The construction is based on a high-strength structure made of high-quality steels and a state-of-the-art welding process for a long service life.

Intermediate reaming heads	Ø OD [mm]
300	324/630
300	324/820
300	324/1.020
300	324/1.220
400	426/720
400	530/1.020
600	630/1.020
600	630/1.220
600	630/1.220
600	630/1.420
700	720/1.220
800	820/1.220

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Reaming heads	Ø OD [mm]
200	219
250	279
300	305
300	324
300	325
350	368
400	406
400	419
400	426
500	508
500	530
600	610
600	624
650	660
700	711
700	720
800	820

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Actively driven powered reaming heads and cutting heads

PERFORATOR's actively driven powered reaming heads (PUD) or cutting heads (PPS) are the ideal basis for pilot tube micro-tunnelling. These powerful units increase the drilling diameter of a pilot tube jacking by one or more dimensional steps to match the final pipe diameter. The direction of material transport of the drilled material to the target shaft or pit is reversed. In this way, jacking pipes made of concrete, GRP, vitrified clay or even steel pipes can be laid quickly and efficiently.

Actively powered reaming heads (PUD)

The PUD active powered reaming head uses powerful, hydraulic drives to simultaneously rotate the cutting head and the auger string. The required hydraulic power is supplied via high-pressure hoses through the carrier pipe and operated from the control panel of the auger drilling rig. The PUD is mounted on an installed steel pipe or temporary casing pipe, which already contains the auger string. This allows the installation of carrier pipes in various diameters without the need for additional, larger temporary casing pipes and auger strings. PUDs are a clever and efficient solution for saving drilling accessories and set-up time on the construction site. The PUD product range includes various nominal diameters from ND 250–1.200 mm and delivers maximum torques between 3.500 Nm and 86.000 Nm.

Actively driven powered cutting heads (PPS)

Driven drill heads (PPS) have two independent pump circuits and hydraulic drives that allow the speed and direction of both the cutting head and auger string to be controlled independently. This guarantees full power for the material transport of the drilling material as well as full power at the cutting head at the same time. The PPS system allows for longer and multi-dimensional enlargement in one operation while reversing the direction of material transport of the drilled material to the target shaft or pit. The PPS process allows for the individual selection of the product pipe type and adaptation to almost all soil conditions, high-pressure jet nozzles improve the transport of the drilled material and support the cutting effect at the drill head in cohesive soil conditions. Integrated lubrication ports minimise friction on the carrier pipe.



Powered reaming heads (PUD)		
Max. torque [Nm]	Max. ND carrier pipe [mm]	Max. OD casing pipe [mm]
3.500	250/300	279
6.500	400	279
9.000	400	279
18.000	500	419
36.000	600	419
63.000	800	419
86.000	1.000	Intermediate reaming

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Powered cutting heads (PPS)		
Max. torque [Nm]	Max. ND carrier pipe [mm]	Max. OD casing pipe [mm]
18.000	500/600	273/279
36.000	700/800	406/419
63.000	900/1.000/1.100	610/624
80.000	1.200/1.300/1.400	813/820

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Augers, temporary casing pipes and cutting heads

Temporary casing pipes and the augers are mounted directly behind the reaming head and the pilot tube string. The reaming head enlarges the borehole from the pilot tube diameter to the casing pipe or carrier pipe diameter. The augers transport the drilling material into the starting pit. Depending on the carrier pipe diameter, several expansion steps are required.

Temporary casing pipes and augers are available for various diameters, pipe lengths and connection types. In addition to the standard delivery programme, we also offer groundwater augers (sluice augers) and hollow drill augers. All sizes and types can be designed and manufactured to customer requirements.

Temporary casing pipes		
Ø OD [mm]	screw type	plug type
121	X	-
140	X	-
152	X	-
168	X	-
178	X	-
219	X	X
244	X	X
279	X	X
305	X	X
318	X	X
343	X	X
368	X	X
406	-	X
419	X	X

Available in lengths 0.3-3.0 m, other dimensions and lengths on request.
Data subject to change. We do not take any liability for printed errors and/or mistakes.

Augers	
tool joint	Ø OD [mm]
HEX 32	100-350
HEX 41	100-420
HEX 50	125-500
HEX 60	240-720
HEX 76	250-880
HEX 90	380-1.000
HEX 120	680-1.400
HEX 152	380-1.400

Available in lengths 0.3-3.0 m, other dimensions and lengths on request.
Data subject to change. We do not take any liability for printed errors and/or mistakes.

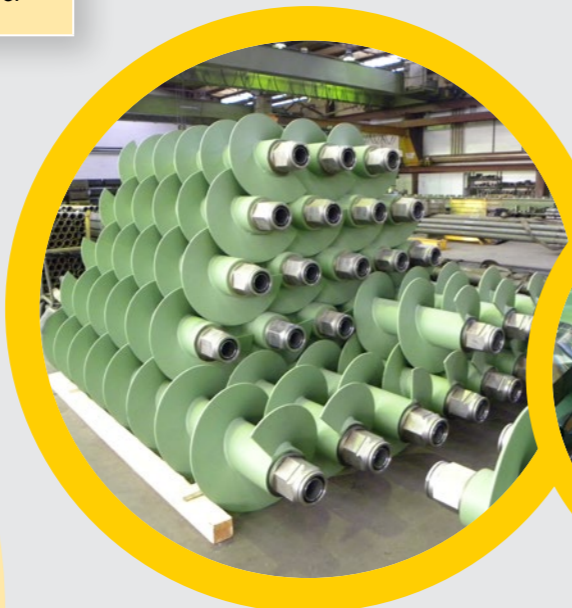
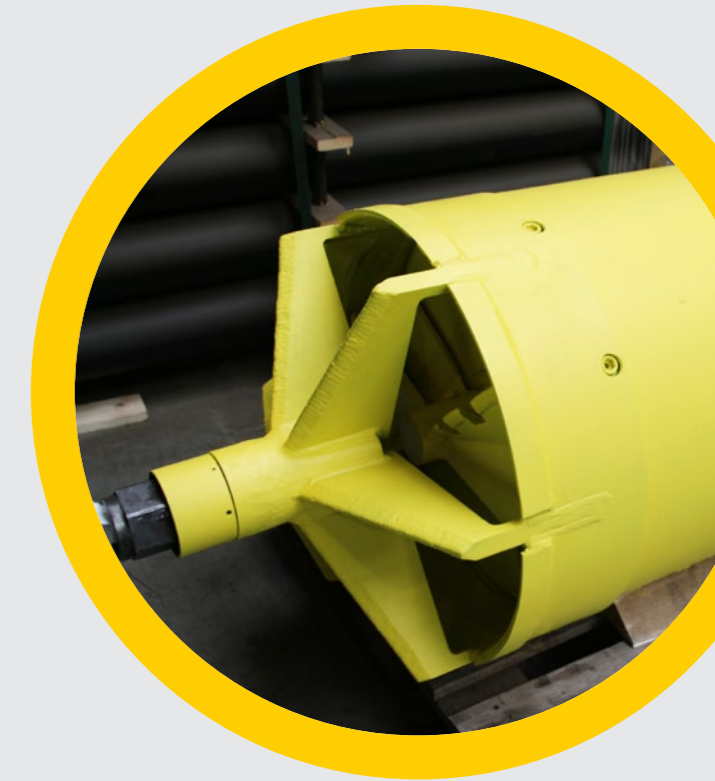
Groundwater augers (sluice augers)

prevent uncontrolled discharge of the drilled material at high groundwater levels and flowing soil types. They can be used for both unguided and guided drilling, where they are installed directly between the pilot tubes and the casing pipes. Groundwater levels of 4 m above invert level are therefore possible.

The groundwater auger has two bulkheads at the front and back with an opening angle of 100 degrees. A multi-flight auger is located between the bulkheads to allow for the continuous transport of excavated material. When the first bulkhead is closed at the front, the second front bulkhead and the rear bulkhead are open. This causes one side of the chamber to always be open and the other closed. In this way, the drilling material can be permanently transported away without soil escaping in an uncontrolled manner. Groundwater augers minimise the risk of cavities and subsidence during drilling and are essential guarantees of success in difficult ground conditions.

Hollow drill augers

are usually used for simultaneous pilot tube widening bores. This involves drilling a series of hollow drill augers over the pre-installed pilot tube while simultaneously installing the steel pipe along the drilling axis. The method is often used for blind holes and, in good ground conditions, for boreholes up to 1.000 mm where multi-stage drilling is not required.

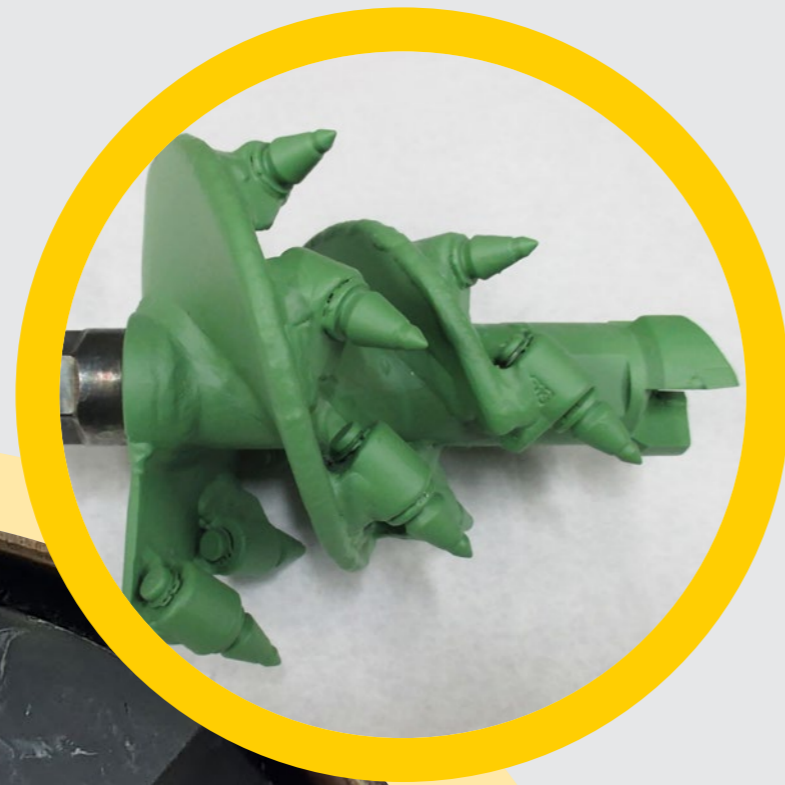


Augers, temporary casing pipes and cutting heads

Cutting heads

Cutting heads loosen and transport the drilling material. The type of drill head to be selected depends primarily on the respective ground conditions, the technique used and the diameter of the pipe to be laid. Regardless of whether clay, sand, loam, gravel or solid rock, the right drill head guarantees drilling success.

Standard drill heads are trench wing cutters and wing cutters; for hard rock drilling, hammer drill bits are also used in combination with pneumatic hammer systems.



RBZ Pipe bursting systems

Pipe bursting systems

With the PERFORATOR RBZ-series bursting systems, pipes can be renewed and renovated in an environmentally friendly manner and without trenching in old routes. Depending on the requirements and the damage to the old pipeline, various methods can be used.

The static pipe bursting method is used for the renewal of pipelines in old routes. Regardless of whether it is a gravity or pressure pipeline, the old pipeline is cut into segments by breaking or cutting, and displaced radially into the surrounding soil. At the same time, a new pipe of the same or larger dimension is pulled in. The bursting method is suitable for almost all old and new pipe materials.

The pressing/drawing process involves the complete replacement of existing pipelines in a single operation. The old pipe is completely removed from the ground. The new pipe can be drawn in with the same or larger dimensions.

The auxiliary pipe method is also a route-equivalent, complete replacement of existing pipelines in two work steps. It is particularly suitable for old pipes made of cast iron, ductile cast iron, steel and fibre cement. As with other same-route renewal procedures, the new pipe can be pulled in in the same or larger dimension

In the relining process with annular gap, pipe strings or individual pipes are inserted into the existing pipelines. The pipe dimension is reduced and the annular gap is filled depending on the process variant. In relining processes without an annular gap, a PE pipe string with a reduced cross-section is inserted into the old pipeline. In the reduction process, the new pipe later lies close to the old pipe wall (close-fit). Both process variants are suitable for both gravity and pressure pipes.

The RBZ series comprises two machine sizes. This means that pipelines up to a pipe diameter of 1.000 mm can be laid trenchlessly.

Pipe bursting units	RBZ	60	160
Jacking shaft	[m]	L=1,5 (2,0)	L=4,5
Thrust force	[kN]	450	1600
Pullback force	[kN]	600	1600
Rod diameter	[mm]	60	168
Old pipe ID (min.)	[mm]	80	200
New pipe OD (max.)	[mm]	324	1.000
Length	[mm]	750	4.250
Width	[mm]	565	2.000
Height	[mm]	700	1.720
Weight	[kg]	660	1.660
Power pack	[-]	HS-1D/ HS-1E	HS-1D/ HS-1E

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KOBUS Pipe Puller technology

The KOBUS Pipe Puller technology has been developed for trenchless house connection renewal using the static winding method. The method can be used to renew gas and water house connection pipes made of copper, lead, steel and polyethylene (PE) from DN 15 (1/2") to DN 32 (1 1/4") mm without trenching. The sectional length is up to 25 m depending on the subsoil conditions and the local conditions.

Polyethylene (PE) pipes up to a diameter of DN 40 (1 1/2") are used as new pipes. The old pipe can be replaced with a new pipe that has the same dimensions or that has larger dimensions. Both standard pipes in SDR 11 and pipes with protective properties can be used. It is also possible to install a protective pipe for the installation of the product pipeline.

The KOBUS KPP series comprises two device types:
 KPP 300 – This machine is a stand-alone solution for independent handling, modular in design and powered by a separate hydraulic power unit. The maximum tensile force is 100 kN and therefore allows for a range of applications for shorter distances and smaller diameters. The modular design also allows for use in areas with limited accessibility (e.g. gardens and buildings) and transport in a box truck or flatbed truck.

KPP 400 – The Pipe Puller is the all-in-one version as an attachment for the mini excavator from the 1.6 t class. It is driven via the auxiliary hydraulics, safely from the driver's seat. The maximum tensile force is 200 kN and allows for the full range of applications. The drive via the mini excavator reduces the investment volume and avoids additional aggregates on site. The transport takes place on the trailer of the mini excavator or on the loading area of the small truck. The low weight of just 320 kg allows for the use of existing transport concepts.

KOBUS Pipe Puller	KPP	300	400
Single pull length max.	[m]	20-25	25
Pullback force	[kN]	100	200
Pulling cable diameter	[mm]	8, 9, 10	8, 9, 10, 14
Old pipe (min.) ND	[mm]	15 (1/2")	15 (1/2")
New pipe (max.) OD	[mm]	32 (1/4")	40 (1 1/2")
Length	[mm]	700	900
Width	[mm]	600	600
Height	[mm]	1.730	1.700
Weight	[kg]	150	320
Power pack/Excavator	[-]	Hydraulic power pack	Excavator 1,6-2,5 to

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VAB Vertical augers

Attachment augers have proven themselves for many years, especially in explosive ordnance exploration, but are also widely used in pile driving and geotechnics as well as in gardening and landscaping (planting, pile and foundation holes).

Vertical auger attachments can be quickly and easily mounted on many carriers such as mobile excavators, loader cranes, tractors or loaders. With an extensive range of tools, augers can be used universally for many applications and soil types.

Vertical auger drive	VAB	28/140	32/200	32/210	48/350	50/460	70/900	120/1800
Gear	[-]	direct	direct	direct	planetary gear	planetary gear	spur gear	spur gear
Torque	[Nm]	1.400	2.000	2.400	3.500	4.600	9.000	18.000
Max. rpm	[U/min]	183/150	150	150	65	78	50	50
Oil demand per rotation	[l/U]	0,37/0,47	1	1	1,4	1,66	3	6
Operating pressure max.	[bar]	175	175	175	175	200	200	200
Permissible axial load	[kN]	12	16	16	20	20	200	200
Min. drilling diameter Ø	[mm]	100	100	100	175	175	200	200
Drilling depth min. Ø	[m]	12	12	12	10	10	20	20
Max. drilling diameter Ø	[mm]	320	320	320	480	550	700	1200
Drilling depth max. Ø	[m]	4	4	4	4	4	4	4
Tool connection	[mm]	41	41	41	41	60	60	90
Weight without tools	[kg]	50	65	100	150	300	520	600

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PERFORATOR service

In addition to high-quality products, PERFORATOR offers its customers a wide range of services. Together with our worldwide partner network, we stand for comprehensive service and competent advice.

Spare parts and accessories

Do you need spare parts and accessories for your PERFORATOR machine? We offer you a wide range of high-quality original spare parts in OEM quality and high-quality drilling accessories "Made by PERFORATOR". Our team of specialists knows your machines and will quickly find the right part!

Maintenance and repair

Regular and qualified maintenance guarantees the maximum performance of your PERFORATOR machine and accessories

throughout their entire service life, while ensuring the highest level of work safety. In the event of a defect, our qualified service staff guarantee a quick and uncomplicated repair. Regardless of whether you visit us in Walkenried or we come to your premises, our range of services will impress you!

Instruction, training and services

Only top qualified employees guarantee high work performance, execution quality, high work safety and a long service life of your machines. Whether providing instruction when using the machine for the first time, recurring regular training, or support on your construction site for special requirements. The PERFORATOR team always offers you the right solution.

Used machines

Whether you are looking for a used machine to expand your portfolio or want to market your machine in the best possible way, we offer you a comprehensive service for used machines. Reconditioning, valuation and trade-in are part of our offer. PERFORATOR machine or third-party brand, it makes no difference to us.

Financing and leasing

Finance machines and accessories in a way that conserves liquidity with leasing and hire-purchase solutions via the PERFORATOR GmbH partner network. Our financing partners do the work for you and find you the best offer on the market. Are you looking for flexible financing and rental solutions for your project business? We offer you the right solution!



Passion



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