

BAUER

MeBo - Sea Bed Drill Rig



BAUER Maritime Experiences



1993

Diamond deposit exploration with a BC cutter in water depth of 160 m
(South Africa)
Atlantic Ocean



2005

Drilling inside of a monopile with a Bauer Fly Drill
(Barrow, UK)
East Irish Sea



2005

First MeBo
Worldwide sea bed core drilling

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2011/2012

Monopile foundation in rock for tidal turbine with BSD 3000
(Orkneys, UK)
Atlantic Ocean



2017

Relief drilling with Dive Drill
(North Sea, UK)

For more information please see brochure “BAUER Maritime Technologies”



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The MeBo exploration drilling rig is a mobile drilling rig remotely controlled from a vessel. It is used in water depths of up to 4,000 meters primarily for core drilling to depths of up to 200 meters under the sea floor.

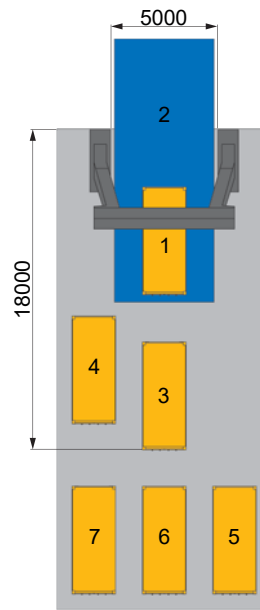
Main areas of application:

- Test drilling in subsoils ranging from loose sediment to hard stone
- Geotechnical exploration for offshore foundations
- Mineral exploration, e.g. diamonds
- Offshore gas or oil drilling
- Exploration of underwater sulfide reserves

Sea bed drill rigs are not affected by any vessel movements due to wind or waves. Since they operate from a stable platform on the sea bed, optimal control of drill-bit pressure is achieved, which is prerequisite for optimal core quality.

Basic technical specifications	
Weight without drilling pipes (in air)	10 to
Max. operating weight (in air)	16 to
Coring diameter	54 – 101 mm
Drilling depth	up to 280 m
Pulling force	100 kN
Pushing force	50 kN
Max. water depth	4,000 m
Transport dimensions	20 ft. container
Vessel requirements	
Required deck space (min.)	18 m x 5 m
Additional required deck space (nos. of 20' ISO containers)	4
Lifting capacity A-frame (min.)	30 t

Technical Specifications



- 1 MeBo
- 2 LARS
- 3 Umbilical Winch
- 4 Tool Container
- 5 Control Container
- 6 Power Pack for winch and transformer unit
- 7 Workshop Container

The umbilical winch, the MeBo, LARS and A-Frame have to be in line. The containers 4 – 7 can be stored anywhere on deck of the ship. Required space for installation of LARS and umbilical winch: 18 m x 5 m in line with A-Frame
Additional space: 4 x 20' containers + working area

LARS (Launch And Recovery System)

Launch and Recovery operations up to sea state 4, equals to 16 – 21 knots. Transports the MeBo from the deck, over the ship's side and brings it into the lowering position (vertical). The LARS retaining rails can be adapted to suit a wide range of deck specifications.



Control container

Central, air-conditioned control stand for all MeBo drilling functions, with 2 fully equipped work places. The operation and control of all functions is effected via the proven Bauer B-Tronic with touch screen, joy sticks and further operation panels. The B-Tronic delivers a complete system for monitoring and visualization of production and equipment parameters. All collected data are recorded in the B-Tronic and may be transmitted wirelessly or via USB stick for analysis. Additional information will be provided by the cameras installed at the MeBo and displayed in real time on separate screens.

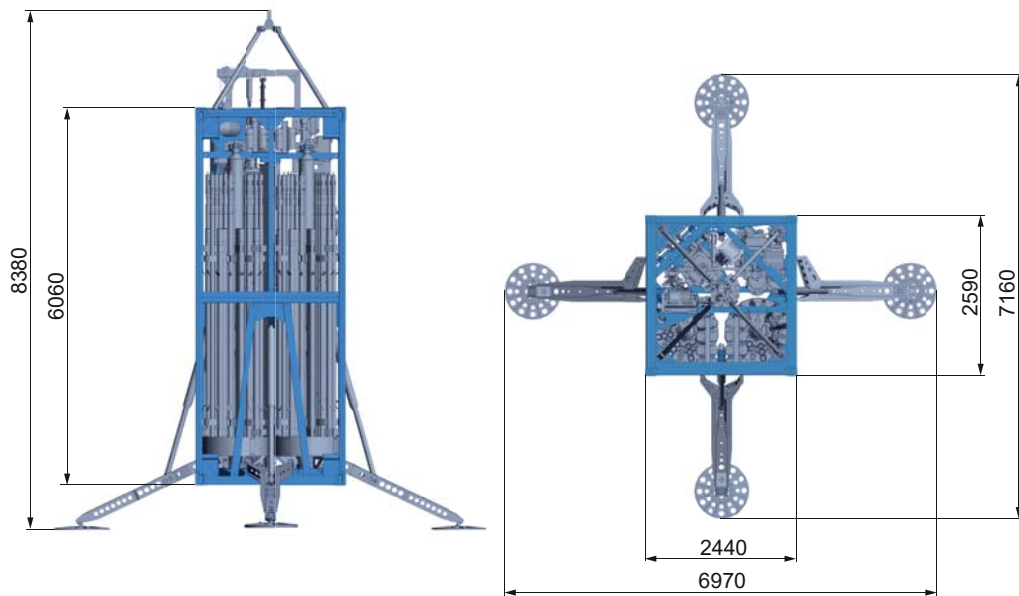


Winch with umbilical

The umbilical is a carrying cable containing multiple load bearing structures, supply lines and optical control conduits. All lines are redundantly present. The umbilical winch with multiple redundant hydraulic drive units provides the necessary lifting force for the MeBo and umbilical.



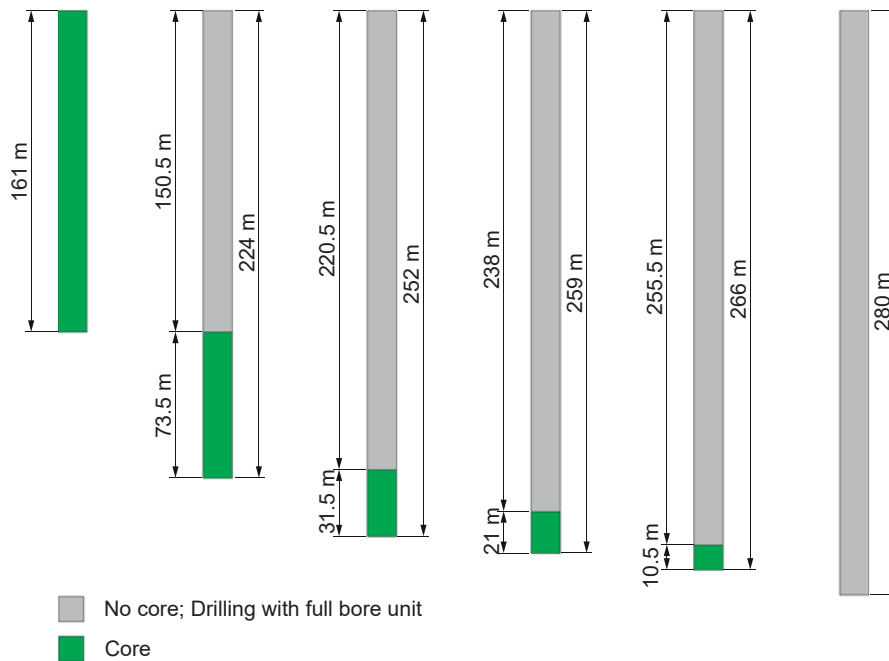
The scope of delivery contains: Container with hydraulic power pack for the umbilical winch, workshop container and rod container



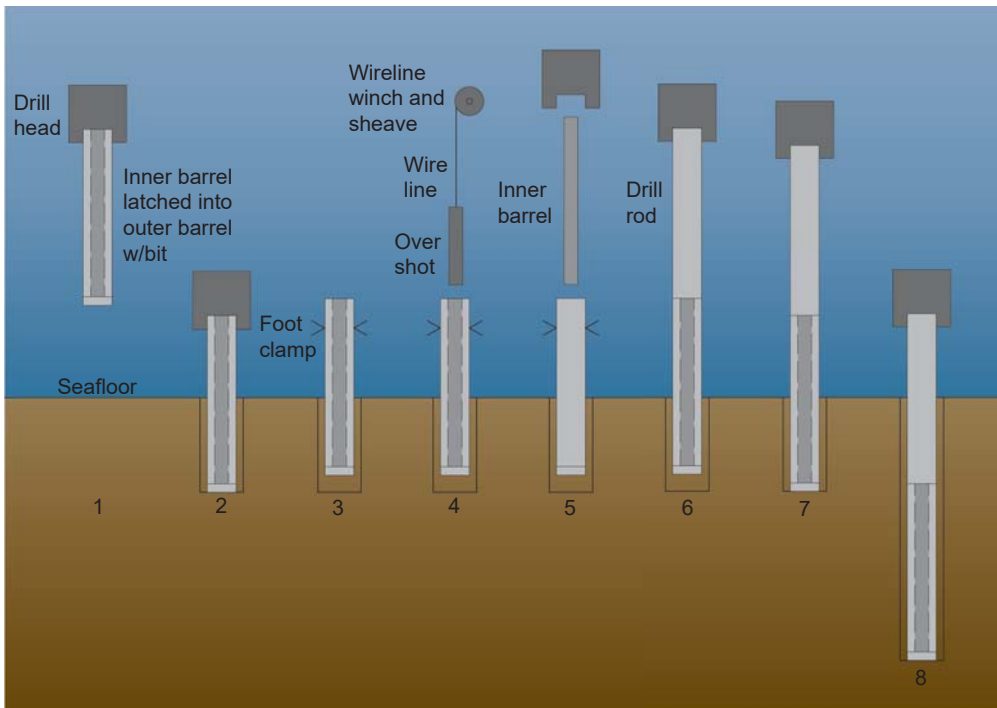
Rotary drive	
Torque max.	1,850 Nm
Speed max.	400 rpm
Tube magazine	
Tube magazine 1: Capacity	48 tubes of 3.5 m each
Tube magazine 2: Capacity	48 tubes of 3.5 m each
Core rope winch	
Pulling force max. (1st layer)	5 kN
Rope speed max. (1st layer)	120 m/min
Rinsing pump	
Delivery rate (nominal)	1,200 l/h
Delivery rate (max)	6,500 l/h
Flushing water pressure (max.)	48 bar

Optional equipment	
H60 hydraulic power pack	Output: 11 kW Working pressure: 300 bar Supplies hydraulic energy to the Launch And Recovery System LARS and the rod loading system
Emergency release fixture	This emergency function allows recovery of the equipment when the rod cannot be pulled out but is still screwed to the KDK
Rod loading system	Rod loading system Supports filling and emptying of the drilling rod magazine Supplied by the H60 hydraulic power pack

Drilling Depth relative to Core Length



Working Sequence – Core Drilling



1. Grab first core barrel assembly – inner barrel latched into an outer barrel with bit
2. Drill and collect first sample
3. Lift off bottom of hole, close foot clamp, move drill head out of the way
4. Move wireline over hole, lower over shot, raise inner barrel (with sample) and store in magazine
5. Get new inner barrel, place in top of outer barrel, release and let drop
6. Attach drill rod
7. Open foot clamp, lower to bottom of hole, start drilling
8. Drill and collect second sample

Available Measuring Equipment for MeBo

Tool	Applications	Properties
Temperature data loggers	<ul style="list-style-type: none"> - Measurement of temperature gradients in shallow and deep sea sediments - Long term observations of temperature fields - High resolution temperature monitoring of fast events with a high sample rate 	<ul style="list-style-type: none"> - Temperature - Autonomous temperature logging data for up to five years
Electrical conductivity probe	<ul style="list-style-type: none"> - Calculation of formation resistivity - Detection of filtrate invasion - Calculation of hydrocarbon (gas hydrate) saturation - Lithology and facies analysis 	Electrical: <ul style="list-style-type: none"> - Formation resistivity - Filtrate invasion - Fluid saturation
Magnetic susceptibility probe	<ul style="list-style-type: none"> - Mineral composition analysis - Calculation of formation resistivity - Lithology and facies analysis 	Magnetic: <ul style="list-style-type: none"> - Electrical conductivity - Magnetic susceptibility - Mineral composition
P-wave probe	<ul style="list-style-type: none"> - Velocity to calibrate seismic data - Input for synthetic seismograms - Calculation of porosity - Fracture evaluation - Gas detection by amplitude analysis 	Acoustic: <ul style="list-style-type: none"> - P-wave velocity - Acoustic attenuation - Density and saturation
Spectrum gamma ray probe	<ul style="list-style-type: none"> - Lithology marker determination - Clay content and type definition - Facies and depositional environment analysis - Radio-isotope detection for tracer 	Radioactive: <ul style="list-style-type: none"> - Total gamma count - Gamma energy spectrum - K, Th and U quantities
In-Situ measurement via pressure core barrels	<ul style="list-style-type: none"> - Pressure core barrels recovered by wireline - The core is locked in the barrel so the core cannot expand no loss of gas/-hydrate - Possibility of in-situ measurement on deck 	<ul style="list-style-type: none"> - Exact in-situ analyses of the core - Quantitative designation of in-situ amount of gas and hydrates
Cone penetration test (CPT)	<ul style="list-style-type: none"> - Foundation soil analysis - Determine geotechnical properties of soils 	<ul style="list-style-type: none"> - Properties of soil - Liquefaction-triggering resistance - Peak pressure - Skin friction

A combination of two different measuring devices may be used in MeBo200



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