

Herrenknecht Vertical

Automated Rig Technology

The exploration of new energy deposits is one of the global challenges for future energy supply. Whether the development of onshore and offshore oil and gas or deep geothermal energy is economically reasonable also depends on the drilling equipment used. Herrenknecht Vertical, a subsidiary of Herrenknecht AG, the market leader in mechanized tunnelling systems, designs and manufactures customized high-quality rigs for drilling, workover and decommissioning, meeting the needs of our customers and their projects. The hydraulic rig concepts for drilling to 8,000 meters incorporate comprehensive, safety-based automation, setting new standards of safety, efficiency and environmental protection. **Automated Rig Technology. Engineered and built for your performance.**



Headquarters in Germany, active worldwide. With more than 40 years of engineering and manufacturing experience, around 5,000 employees and 76 locations within the Herrenknecht Group, we support our customers globally.

TI-350 SLINGSHOT

OIL DRILLING IN BRAZIL'S JUNGLE



Drilling rig TI-350 with slingshot substructure for efficient oilfield development in Brazil



HERRENKNECHT VERTICAL GMBH
Im Heidenwinkel 5
77963 Schwanau
Germany
Phone +49 7824 302-1300
Fax +49 7824 302-1330
info@herrenknecht-vertical.com
www.herrenknecht-vertical.com

**AUTOMATED
RIG TECHNOLOGY**



TI-350 Slingshot for remote oil drilling

As resources become more and more scarce, oil production is becoming increasingly expensive. In addition to the rise in the cost of equipment and personnel, the cost of exploration and development of new reservoirs is also increasing. The use of state-of-the-art drilling rigs from Herrenknecht Vertical ensures that energy companies will be able to continue economic oil and gas production in the future.

- › A high level of work automation helps to reduce rig floor personnel, which is possible thanks to the sensitive hydraulic cylinder hoisting and the hands-off pipe handling system. This means less personnel costs and more working safety.
- › Only 59 transport units are necessary for the whole rig package, so that the transport costs can be reduced.
- › The complete well site only needs an area of approx. 30 x 72 meters. This means lower site costs and optimized positioning possibilities in areas where space is restricted.
- › The mud pumps are encapsulated and the generators have optimized exhaust silencers, spark arrestors and flame retards. This high noise protection makes the rig also suitable for drilling in urban areas.



Herrenknecht Vertical supplied two tailor-made TI-350 Slingshot rigs for Brazil. Mast and slingshot substructure can be erected hydraulically; no heavy load cranes are necessary. The rig is installed horizontally at the well site. The 22 meters (72 feet) high telescopic doubles mast is then erected by hydraulic cylinders. Afterwards, the 9 x 10 meters (30 x 33 feet) substructure and rig floor can be set up to a working height of 9 meters (30 feet) by the slingshot cylinders. Finally, the pipe handler is installed.

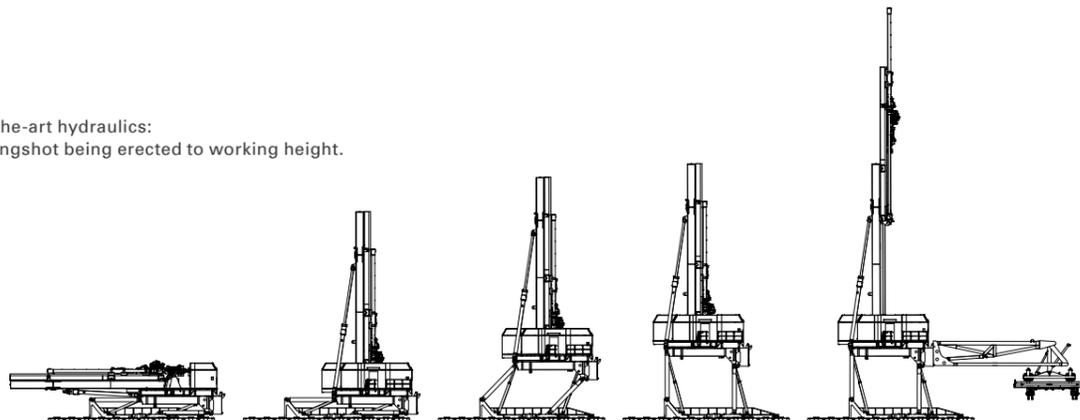
TI-350 SLINGSHOT

- › Max. hook load: 350 mt (375 sht)
- › Max. push load: 160 mt (175 sht)
- › Hoisting power: 1,600 kW (2,200 hp)
- › Top drive power: 800 kW (1,000 hp)
- › Max. tripping speed: 600 m/h (1,970 ft/h)¹
- › Max. drilling depth: 6,000 m (19,700 ft)²
- › Mud pumps: 2 units per 1,000 kW (1,340 hp)
- › Generators: 3 units per 1,540 kW

¹ depends on training level and experience of the crew

² depends on inclination and string weight as well as formation and casing design

State-of-the-art hydraulics:
TI-350 Slingshot being erected to working height.



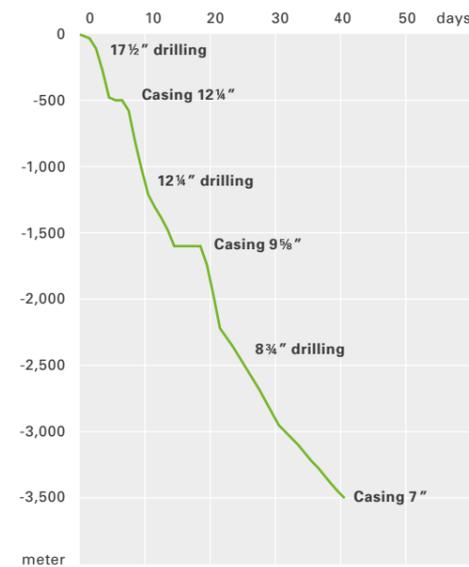
Efficient oilfield development

To ensure continued economic exploitation of the oil fields in the northeast of Brazil, Petrobras, the country's largest energy company, decided for two Herrenknecht Vertical slingshot rigs. Heavy-load cranes are not available in this remote area. This is where the full benefits of the hydraulically erectable mast and slingshot substructure come to bear.



Our service ensures that the rigs are in continuous operation.

TIME-DEPTH-DIAGRAM*



* example of one successful well drilled in Bahía

OIL DRILLING IN BRAZIL

- › Location: Bahía region, Brazil
- › Well depths: up to 4,200 m (13,800 ft)
- › Well diameter: 444.5 mm - 215.9 mm (17 1/2" - 8 1/2")
- › Total no. of wells: 64
- › Total drilling depth (MD): approx. 195,000 m (639,800 ft)
- › Geology: Aliança formations

Between 2009 and 2016 the two rigs drilled 64 wells at several locations in the Bahía region. The slingshot technology ensured a fast and safe rig move procedure.

