



Keeper High-Speed Gyro Survey/Steering System

Definitive Survey/Orientation System

Scientific Drilling's Keeper is the fourth-generation North-seeking gyro surveying system. Keeper operates in continuous mode from vertical through horizontal. It is capable of providing definitive surveys, orientations, and gyro steering at all inclinations and orientations. Keeper is more accurate, more versatile, and much faster than any other small-diameter system.

Lightning Speeds

Keeper's proprietary state-of-the-art gyro allows surveying "on the fly" from vertical through horizontal at wireline speeds up to 400 feet per minute. This high-speed capability translates into significant rigtime savings when compared to other gyro compass tools.

Expertise and Reliability

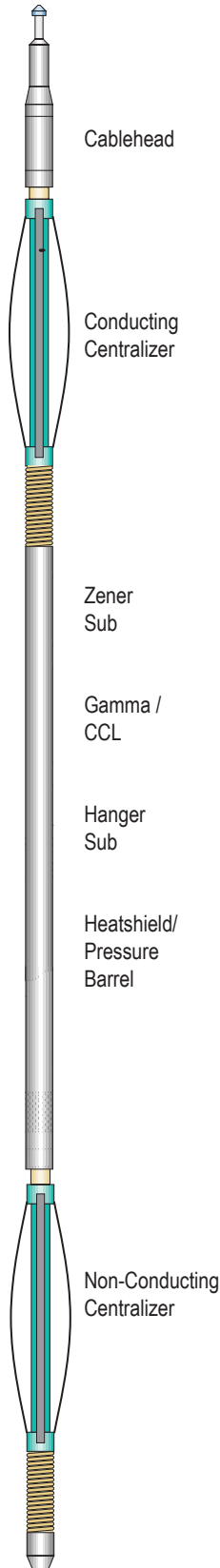
Keeper surveys are performed by Scientific Drilling's highly-trained and experienced Directional Surveyors and support teams. Strict pre- and post-job quality assurance and calibration checks are performed. Continuous monitoring during the job ensures the highest surveying standards are maintained.

Application Versatility

Keeper's small diameter and adaptable running gear provide configurations for surveying in drillpipe and tubing as small as two inches internal diameter. Keeper performs casing, high angle pump down, and pipeline surveys. Keeper's unique versatility enables individual solutions to diverse survey requirements.

Robust Gyro Steering

Keeper's durable and rugged sensors allow for steering-while-drilling. Continuous directional information is available from vertical even in the presence of magnetic interference. Keeper's versatile and fast space-stabilized servo system reports real-time gyro toolface continuously to a rig floor display.



OPTIONAL FEATURES

- **Temperature Log.** Combined with a temperature logging tool, Keeper locates "cement tops" after running casing
- **Gamma Ray/Casing Collar Locator (CCL).** Combined with Keeper, a gamma ray/CCL logging device aids in depth correlation
- **Survey/Logging Combination Runs.** Keeper can be run with electric wireline logs.

TECHNICAL SPECIFICATIONS

Accuracy*	Subject to well profile			
Pressure Rating	20,000 psi (137,900 kPa)			
Survey Speed	Maximum 400 ft/min (122 m/min)			
Diameter	1.75 in (4.5 cm)	1.85 in (4.7 cm)	2.125 in (5.4 cm)	3.0 in (7.6 cm)
Length	18 ft (5.5 m)	19 ft (5.8 m)	19 ft (5.8 m)	16 ft (4.9 m)
Weight	110 lbs (50 kg)	120 lbs (54 kg)	140 lbs (63 kg)	300 lbs (136 kg)
Temperature Rating	257°F (125°C)	400°F (204°C)	400°F (204°C)	400°F (204°C)

*SPE WPTS compliant error ellipse calculations available upon request for individual well profiles.

