



Siteline Keeper Gyro *Siteline Reference Mode*

Survey & Orientation Under Motion

North-seeking technology has greatly improved survey and orientation accuracy. However, gyro compassing requires a motionless environment to capture an initial heading. Gyro compassing is subject to huge errors in applications such as offshore kickoffs at or near seabed, drillpipe surveys and orientations on floating vessels, flowing wellbores, and any other condition where tool stability is affected by motion.

Siteline Keeper's Time & Cost-Savings Solution

Scientific Drilling has engineered a solution that incorporates North-seeking/attitude reference technology with sightline reference gyro simplicity. Keeper Gyro System with Siteline Reference Mode (Siteline Keeper) is an accurate, all-in-one proprietary solution. Siteline Keeper reduces survey orientation time and improves survey accuracy over the alternative motion influenced gyro compass mode. The system eliminates the cost of down-time due to excessive downhole motion and the corresponding difficulty in collecting accurate gyro compass information while moving. The chart at the right illustrates the time savings (>300%) of Siteline Keeper over traditional gyro compassing tools which translate directly into significant cost savings.

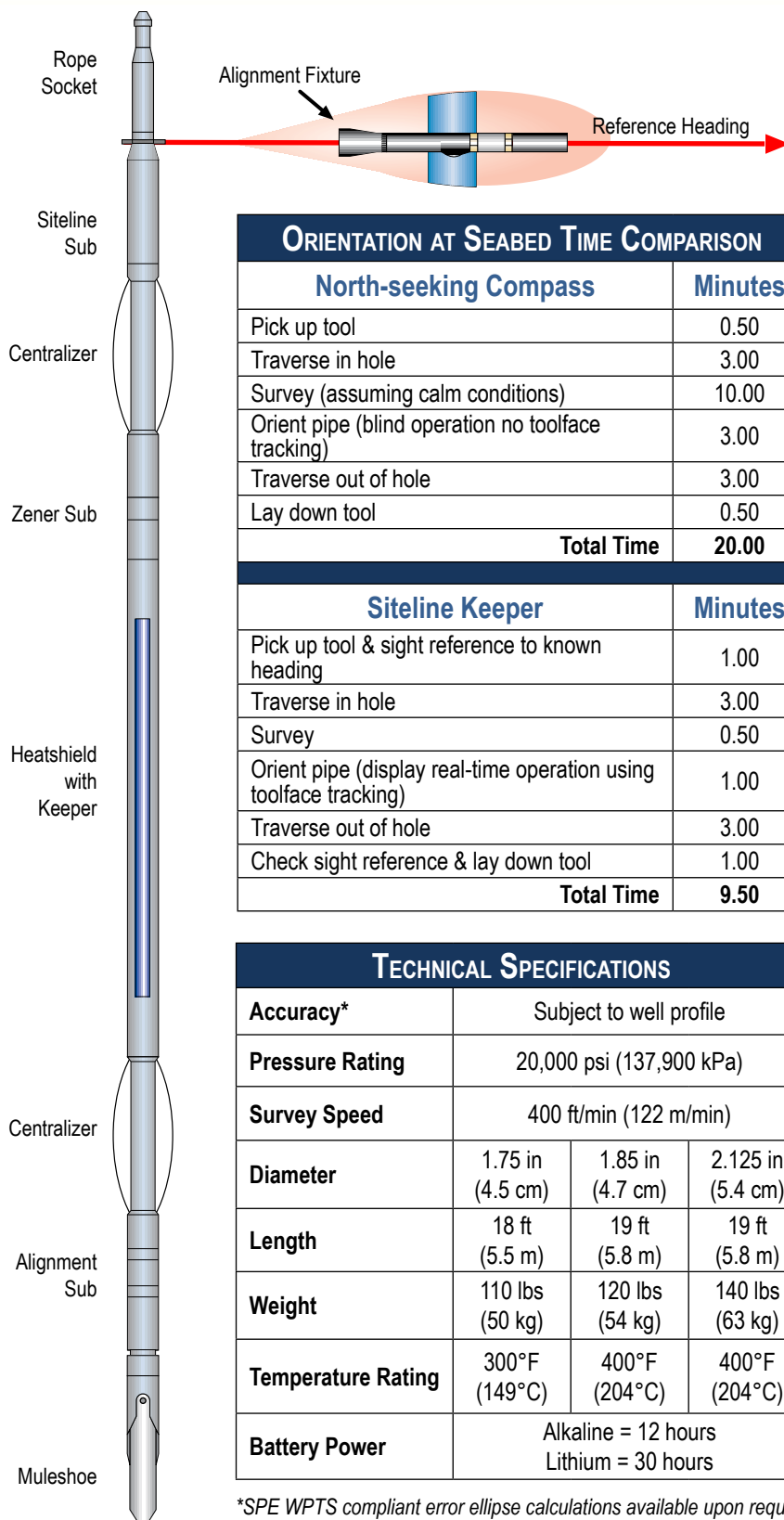
Application Versatility

Siteline Keeper is a highly-effective survey/orientation solution in any application where tool stability cannot be maintained, such as:

- Offshore kickoff at or near seabed
- Drillpipe surveys/orientations on floating vessels
- Template or wellhead surveys/orientations

ADVANTAGES

- **Under-Motion Operations.** Not susceptible to errors due to motion.
- **Multiple Modes in One.** Capable of quickly switching between sightline reference and gyro compassing modes in one package
- **Faster Set-up.** Initial heading capture is faster (10-20s) than gyro compassing tools that can take many hours of preparation and data collection to collect the initial heading.



ORIENTATION AT SEABED TIME COMPARISON	
North-seeking Compass	Minutes
Pick up tool	0.50
Traverse in hole	3.00
Survey (assuming calm conditions)	10.00
Orient pipe (blind operation no toolface tracking)	3.00
Traverse out of hole	3.00
Lay down tool	0.50
Total Time	20.00
Siteline Keeper	
Siteline Keeper	Minutes
Pick up tool & sight reference to known heading	1.00
Traverse in hole	3.00
Survey	0.50
Orient pipe (display real-time operation using toolface tracking)	1.00
Traverse out of hole	3.00
Check sight reference & lay down tool	1.00
Total Time	9.50

TECHNICAL SPECIFICATIONS			
Accuracy*	Subject to well profile		
Pressure Rating	20,000 psi (137,900 kPa)		
Survey Speed	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)
Length	18 ft (5.5 m)	19 ft (5.8 m)	19 ft (5.8 m)
Weight	110 lbs (50 kg)	120 lbs (54 kg)	140 lbs (63 kg)
Temperature Rating	300°F (149°C)	400°F (204°C)	400°F (204°C)
Battery Power	Alkaline = 12 hours Lithium = 30 hours		

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