KERR MEASUREMENT SYSTEMS, INC.
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THE SHARK

COMBINED DEPTH/TENSION SLICKLINE MEASUREMENT DEVICE

AMSLA102

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GENERAL DESCRIPTION

The SHARK is a two wheeled device which accurately measures wireline depth and tension. It is designed to be mounted in front of the wireline drum on a spooling mechanism. Linear bearings in the mount allow it to slide back and forth in front of the drum so the wire can be spooled evenly. The head can be hung from an overhead bar or can sit on bars located at the base of the drum.

The wire runs from the well around the measure wheel (wheel nearest drum) then around the tension wheel and back across the top of the measuring wheel onto the drum in a non reverse bend configuration (minimizes wire fatigue). Even though the wire runs side by side across the top of the measure wheel, the system is designed to prevent wire to wire rub. The tension wheel is tilted slightly with respect to the measuring wheel so that the wire enters the wheel on one side of the groove and exits the wheel on the opposite side of the groove.

Guide rollers are installed on the tension wheel to keep the wire in the groove. A spring mounted guide roller is used on the measure wheel to ensure the wire is always pressed tightly against the measure wheel. This prevents wire slippage at low tension and minimizes measurement error. The spring tightly presses the wire against the wheel regardless of wire size. The spring force keeps the wire turning the wheel even with sudden changes of direction during jarring action. A composite guide roller is mounted above the measure wheel to keep the wire in the groove when tension is relaxed such as during transport and rigup.

With the Kerr Measurement Systems Inc. Winchman's Panel, depth can be accurately measured on different sized lines without changing wheels. This is done electronically by the panel using the depth information provided by an encoder. Changes in wire size are accounted for by the panel software. Wire stretch can also be automatically calculated by the panel.

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TENSION SPECIFICATIONS

The wheel nearest the well rotates on an axle pin that is instrumented with strain gauges. These strain gauges produce an electrical signal proportional to the magnitude of line tension. Since the two wheels are opposite each other, the wire completely wraps around the tension wheel. This creates a relatively high signal at the load pin which provides a highly accurate tension measurement. Since the wire always makes a complete 180 degree wrap around the tension wheel rigup angle does not affect the tension measurement.

The tension wheel is mounted on a self aligning bearing which allows the wheel to properly align itself. This reduces any side forces that may be present which increases the tension measurement accuracy.

Interface:	Kerr proprietary circuit board which amplifies the load pin signals. It can be configured for three different output configurations: 4-20ma current loop 1.5v differential voltage Passive 350 ohm bridge	
Temperature stability:	<= .015% full scale / deg F on zero <= .02% full scale / deg F on output	
Accuracy:	1% full scale nominal	
Maximum load (tested):	4500 lbs	2040 kg
(theoretical):	5000 lbs	2270 kg

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DEPTH MEASUREMENT

Measurement is made by wrapping the wire around the measuring wheel which has a precision machined groove. The wheel groove has a circumference of 4.000 feet. The wheel is hardened to greater than Rockwell 58 by using a special heat treat process. This minimizes wheel wear to maximize wheel life.

This measuring head is capable of providing three completely independent depth measurements, a mechanical counter, an electronic encoder, and a magnetic pickup.

An optical encoder can be mounted on the measuring head which provides a high resolution measurement to the Kerr Measurement Systems Inc. hoistman's panel. With this panel, depth and line speed can be accurately measured on different sized lines without changing wheels. Changes in wire size are accounted for by the panel software. Wire stretch can also be automatically calculated by the panel. The tension reading is used along with the measured depth to accurately display tha actual tool depth. The panel operates on 12vdc and supplies the necessary power to the encoder and load pin.

A optional secondary Backup Depth System is available. This system provides an independent depth measurement. It consists of a small panel mounted inside the wireline unit and a magnetic pickup mounted in the measuring head. The panel is designed to be connected to an external AC or DC supply. In the event of an external power interruption, the unit continues to operate normally on battery power. Two batteries are used, with a warning indicator to show when the first battery is exhausted. The unit conserves battery power by switching itself off after a period of inactivity. The unit will operate for over 18 hours on fully charged batteries. When external power is available, the batteries are always being charged.

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SPECIFICATIONS:

Height:	29.5"	.75 m
Length	37"	.94 m
Width:	11.5"	.292 m
Weight:	94 lbs	2.7 kg
Maximum Tension:	4500 lbs	2040 kg
Line Sizes: .	092" – 3/16"	2.3 mm – 4.76 mm
Encoder:	1200 PPR (or customer specification)	
Backup Counter:	4 PPR Quadrature	
Load Pin output:	4-20ma current loop 1.5v differential output Passive 350 ohm bridge