BenchMark Wireline Products
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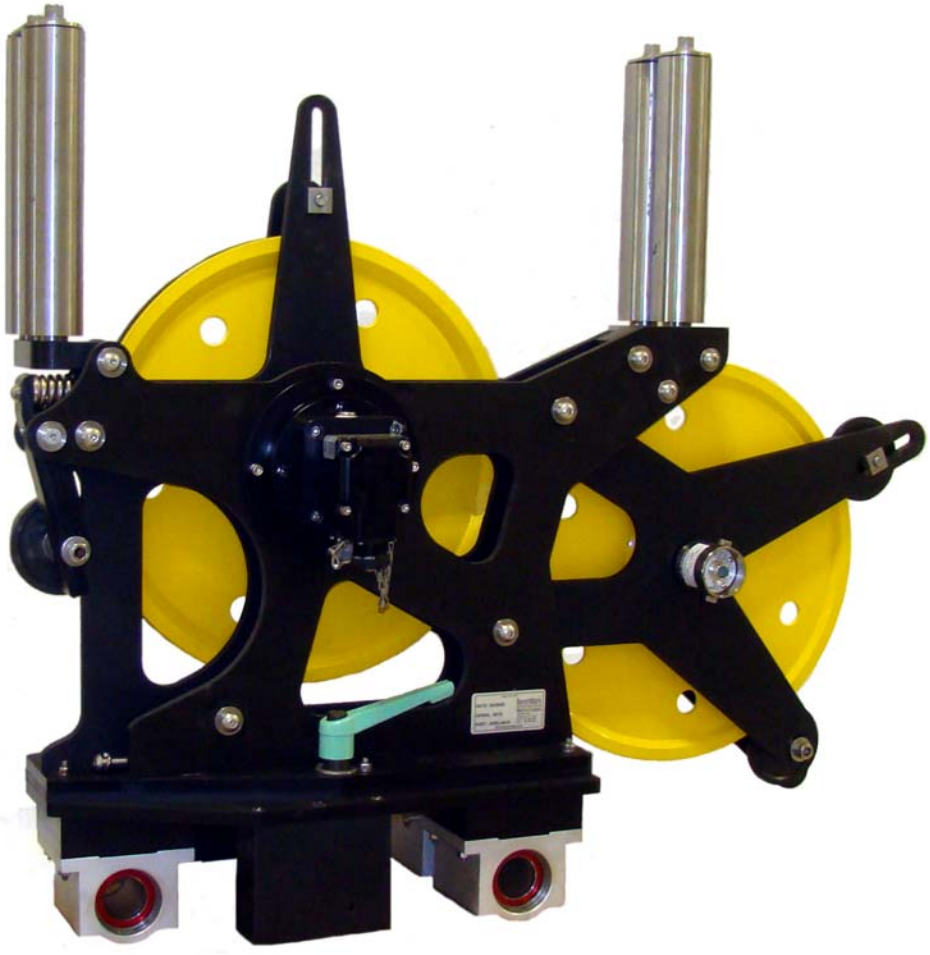
MEGA MOUTH

HEAVY DUTY 3 WHEEL
SLICKLINE MEASUREMENT DEVICE

WITH COMBINED DEPTH AND TENSION
CERTIFIED FOR USE IN A ZONE 2 ENVIRONMENT

AMSLA416



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GENERAL DESCRIPTION

The "MEGA MOUTH" Slickline Measuring Device is a heavy duty three wheeled device which accurately measures both wireline depth and tension. It minimizes wire abrasion and fatigue by using a non reverse bend configuration.

The measuring device is certified for use in a zone 2 environment. Both the passive bridge load pin and the depth encoder are zone 2 certified as well.

The device 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. Spooling rollers and pressure wheels are provided to keep the wire in the wheels at low or no tension. An optional "turn table" is available which allows the head to be pivoted 90 degrees for shipping protection.

This measuring head is unique from previous versions in that the wireline can be removed from the measuring head without cutting off the re-head. The wireline can be removed from the side. The guide rollers are slotted so they can be slid out of the way to remove the wireline.

Tension is measured from a load pin which also serves as the axle for the tension wheel. Since the depth and tension wheels are opposite each other, the wire completely wraps around both wheels. This creates a relatively high signal at the load pin which provides a very accurate tension measurement.

A third wheel spring mounted guide wheel is provided to ensure the wire is always pressed tightly against the measure wheel. This prevents wire slippage at low tension to minimize 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.

With the BenchMark 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. An adapter is provided to drive a standard mechanical counter.

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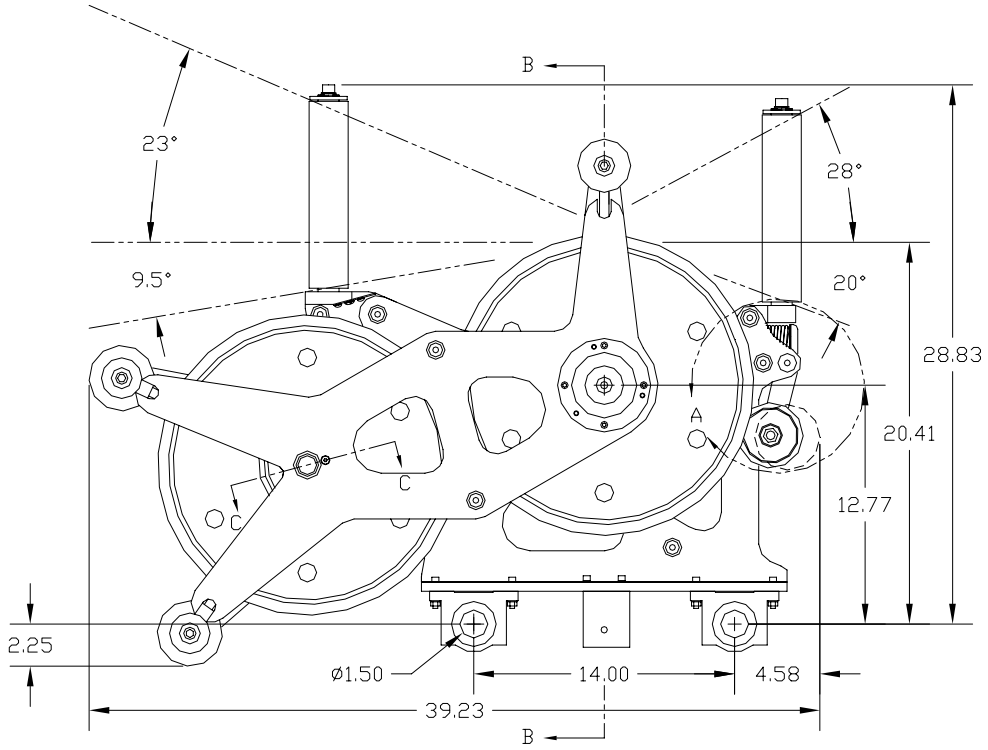
TECHNICAL DESCRIPTION AND SPECIFICATIONS

Height:	29.5"	.75 m
Length	39.25"	.997 m
Width:	11.5"	.292 m
Weight:	110 lbs	54.4 kg
Maximum Tension:	10,000 lbs	4536 kg
Line Sizes:	.092" – 1/4”	2.3 mm – 6.35 mm
Encoder:	1200 PPR	
Backup Counter:	4 PPR Quadrature	
Load Pin:	Passive Bridge	



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WIRE PATH:

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. 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 aligned to assist in keeping the wire on the proper side of the groove.

The wire runs through a non reversed bend configuration (i.e. the wire is always bent in the same direction). This minimizes wire fatigue due to bending the wire in opposite directions each time it passes through the measuring head. The large wheel radius minimizes the effects of fatigue and promotes longer wire life, especially with larger diameter wirelines.

Guide rollers are installed on the tension wheel to keep the wire in the groove. A composite guide roller is mounted above the measure wheel to keep the wire in the groove when wireline tension is relaxed such as during transport and rigup.

DEPTH MEASUREMENT:

Depth 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 feet with .125 wire installed. 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 optical encoder, and a magnetic pickup.

The optical encoder provides a high resolution measurement to the BenchMark Wireline Products, Inc.hoistman's panel. With this panel depth and line speed can be accurately measured on different sized lines without changing wheels. This is done electronically by the panel. Changes in wire size are accounted for by the panel software. Wire stretch can also be automatically calculated by the panel. The panel operates on 12v and supplies the necessary power to the encoder and load pin.

The mechanical measurement is made by connecting a "speedometer" cable to the hub of the measuring wheel. A "Veedor Root" type counter can be used. Step down adapters are available to convert from a 1:4 to a 1:1 measurement (adapters on the wheel and in the counter).

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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. The wire always makes a complete 180 degree wrap around the tension wheel so 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.

PASSIVE BRIDGE VOLTAGE:

POWER REQUIREMENTS

12 vdc excitation

TEMPERATURE STABILITY

<= .015% full scale / deg F on zero
<= .02% full scale / deg F on output

ACCURACY 1% full scale nominal

STRAIN GAUGE OUTPUT

SHUNT = 5K lbs line pull
6250 lbs = 2.0mV / V (1/2 line pull)

MAXIMUM LOAD (tested): 9000 lbs (4081 kg)

(Calculated): 10000 lbs (4536 kg)