Humboldt HS-5001EZ Nuclear Density Gauge

The Humboldt HS-5001EZ Nuclear Density Gauge—easy is just the beginning

Humboldt’s HS-5001EZ Moisture/Density Gauge is just that— easy. Easy to operate, easy to power and easy to service. The EZ gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation. It also features our innovative trigger release handle that eliminates pinched fingers while providing smooth operation. Available in 8” (200mm) and 12” (300mm) lengths with either 1” (25mm) or 2” (50mm) increments, the EZ gauge provides a single gauge solution to density and moisture measurements.

The EZ’s versatility allows it to measure density through direct transmission and backscatter modes, as well as including thin lift and trench modes, as well as moisture determinations. The gauge uses an advanced micro-processor-based technology to provide highly-accurate measurements of density and moisture that are automatically computed for direct readouts of wet density, dry density, moisture content, percent of moisture, percent of compaction (Proctor or Marshall), void ratio and air voids.

The EZ Gauge complies with all pertinent standards: ASTM D6938, D2950, C1040 and AASHTO T310. The gauge is calibrated by the Five-block calibration method.

Moisture/Density Gauge— HS-5001EZ121
Measures to 12” (300mm) depth in 1” (25mm) increments.

Moisture/Density Gauge— HS-5001EZ122
Measures to 12” (300mm) depth in 2” (50mm) increments.

Moisture/Density Gauge— HS-5001EZ081
Measures to 8” (200mm) depth in 1” (25mm) increments.

Moisture/Density Gauge— HS-5001EZ082
Measures to 8” (200mm) depth in 2” (50mm) increments.

Easy to Operate—
Humboldt’s HS-5001EZ Moisture/Density Gauge is just that— easy to operate. The EZ gauge features a menu-driven control panel with easy-to-use, built-in test routines and auto features, making testing a quick and accurate operation.

Easy to Power—
The EZ is powered by six standard AA alkaline batteries, which provide up to 2000 hrs of service. No chargers are needed and you can buy batteries almost anywhere, including the corner convenience store.

Easy to Service—
The EZ gauge also uses a modular design, which allows it to be serviced in the field, if ever necessary. With this gauge, you don’t have to send it back to the factory for repairs, we’ll send you the necessary components and walk you through any repair procedure.
Humboldt HS-5001EZ
Nuclear Density Gauge

Radioactive Materials Data Needed for License Application

<table>
<thead>
<tr>
<th>Radioactive Material</th>
<th>Chemical/ Physical Form</th>
<th>Maximum Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cesium-137</td>
<td>Sealed Source</td>
<td>Not to exceed 11 mCi</td>
</tr>
<tr>
<td></td>
<td>Humboldt 2200064</td>
<td></td>
</tr>
<tr>
<td>Americium-241:Be</td>
<td>Sealed Source</td>
<td>Not to exceed 44 mCi</td>
</tr>
<tr>
<td></td>
<td>Humboldt 2200067</td>
<td></td>
</tr>
</tbody>
</table>

Measurement: Density at 125 pcf (2000 kg/m³)

<table>
<thead>
<tr>
<th>Direct Transmission, 6” (150mm)</th>
<th>15 seconds (Fast)</th>
<th>1 minute (Std.)</th>
<th>4 minutes (Slow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision, pcf (kg/m³)</td>
<td>±0.5 (8)</td>
<td>±0.25 (4)</td>
<td>±0.13 (2)</td>
</tr>
<tr>
<td>Chemical Error, pcf (kg/m³)</td>
<td>±1.0 (16)</td>
<td>±1.0 (16)</td>
<td>±1.0 (16)</td>
</tr>
<tr>
<td>Surface Error, pcf (kg/m³)</td>
<td>-0.5 (8)</td>
<td>-0.5 (8)</td>
<td>-0.5 (8)</td>
</tr>
</tbody>
</table>

Measurement Depth: 2 to 12” (50 to 300mm)

<table>
<thead>
<tr>
<th>Backscatter, 3.5” (88mm)</th>
<th>15 seconds (Fast)</th>
<th>1 minute (Std.)</th>
<th>4 minutes (Slow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision, pcf (kg/m³)</td>
<td>±1.0 (16)</td>
<td>±0.5 (8)</td>
<td>±0.25 (4)</td>
</tr>
<tr>
<td>Chemical Error, pcf (kg/m³)</td>
<td>±2.5 (40)</td>
<td>±2.5 (40)</td>
<td>±2.5 (40)</td>
</tr>
<tr>
<td>Surface Error, pcf (kg/m³)</td>
<td>-3.0 (48)</td>
<td>-3.0 (48)</td>
<td>-3.0 (48)</td>
</tr>
</tbody>
</table>

Measurement Depth: 3.5” (88mm)

<table>
<thead>
<tr>
<th>Moisture at 10pcf (160kg/m³)</th>
<th>15 seconds (Fast)</th>
<th>1 minute (Std.)</th>
<th>4 minutes (Slow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision, pcf (kg/m³)</td>
<td>±0.5 (8)</td>
<td>±0.25 (4)</td>
<td>±0.13 (2)</td>
</tr>
<tr>
<td>Surface Error, pcf (kg/m³)</td>
<td>-0.25 (4)</td>
<td>-0.25 (4)</td>
<td>-0.25 (4)</td>
</tr>
</tbody>
</table>

Measurement Depth: 4-8” (100 to 200mm)

Radiological

**Gamma Source**
- Material, Type and Amount: Cs-137, 370MBq (10mCi)
- Special Form Registration: USA/0654/S
- ANSI and ISO Class: C66546

**Neutron Source**
- Material, Type and Amount: Am-241: Be, 1.48GBq (40mCi)
- Neutron Yield: 90 Kcps ±10%
- Special Form Registration: USA/0632/S
- ANSI and ISO Class: E66545

**Source**
- Type: Sealed Source, Special Form
- Housing: Stainless Steel, Double Encapsulated
- Surface Dose Rates: 18.7 mrem/hr Maximum (Neutron and Gamma)
- Transit (shipping) Case: DOT 7A, Type A, Yellow II Label, O.2 Tl

Electrical

<table>
<thead>
<tr>
<th>Displays:</th>
<th>4 lines x 20 alphanumeric w/ backlit liquid crystal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timer Stability:</td>
<td>0.01%</td>
</tr>
<tr>
<td>Power Supply Stability:</td>
<td>0.10%</td>
</tr>
<tr>
<td>Power Source:</td>
<td>Six alkaline AA-size batteries</td>
</tr>
<tr>
<td>Power Consumption:</td>
<td>Active—6.5mA Battery Life—1400 hours</td>
</tr>
<tr>
<td>Power Protection:</td>
<td>Main Batteries—Circuit Breaker, Regulated Supplies—Short Circuit Proof</td>
</tr>
<tr>
<td>Low Battery Condition:</td>
<td>LOBAT Alarm and Auto Shutoff for low and dead battery conditions</td>
</tr>
<tr>
<td>Battery Life Remaining:</td>
<td>Automatically Estimated at Power-up by activating TEST routine</td>
</tr>
</tbody>
</table>

Mechanical

- Operating Temperature: 14 to 158°F (-10 to 70°C) ambient, 347°F (175°C) Material Surface
- Storage Temperature: -70 to 185°F (-55 to 85°C)
- Humidity: 98% without condensation, Rain-Resistant Construction
- Vibration: 0.1” (2.5mm) at 12.5 Hz

Materials:
- Shielding: Tungsten Powder Alloy
- Source Rod: 440C Stainless steel, Induction, heat treated to 55 Rockwell C
- Gauge Base: Computer-Machined 6061-T6 Aluminum, Hard-Coated and Teflon Impregnated for Anticorrosion
- Index Rod: 7075 aluminum, Hard Coated and Teflon Impregnated
- Top Shell: Injection-Molded Noryl with Integral Color
- Bearing: Relieved Bronze with Neoprene Seals
- Screws/Fittings: Stainless Steel and Brass

Dimensions/Weight

**Gauge**

- Dimensions (base): 15.75” x 8.66” x 5.5” (400 x 220 x 140mm)
- Handle Height: 18” or 21.5” (450 or 550mm)
- Weight: 30 lbs (13.6kg)

**Reference Standard**

- Dimensions: 25” x 7.8” x 3” (350 x 200 x 75mm)
- Weight: 10 lbs (4.5kg)

**Transit Case**

- Dimensions: 31” x 14” x 19.5” (787 x 356 x 495mm)
- Weight: 31 lbs (11.8kg)

**Accessory Case (loaded)**

- Dimensions: 19.7” x 9.8” x 5” (500 x 250 x 125mm)
- Weight: 16 lbs (7.3kg)
- Total Shipping Weight: 90 lbs (41kg)

Nuclear Density Gauge Sales: 1.800.537.4183