Continuous gas analysis of wet sample streams has always presented a challenge. Condensed moisture in the sample line can result in corrosion, measurement error, continual maintenance costs, and damage to the analyzer. Universal Analyzer’s patented TrueProbe™ represents a real advancement in wet gas sampling probe design. Designed for the natural gas industry, the TrueProbe™ uses in-situ filtration to provide a moisture-free, representative gas sample to your analyzer.

**OPERATION**

The patented TrueProbe™ design takes advantage of Bernoulli’s Principle of fluid dynamics to provide an internal fast loop within the probe.

Process gas enters through a sample inlet port at the bottom of the probe where it contacts a cylindrical cross-flow membrane filter. The hollow Teflon filter blocks all liquid and particulates allowing clean, dry sample gas to pass through to the head of the probe for measurement and analysis.

Differential pressure between the sample inlet and two moisture outlets located on the side of the probe creates high flow velocity for residual process gas within the probe. The tangential gas flow sweeps across the membrane surface removing excess condensed moisture and buildup from the filter surface. The combination of liquids and residual process gas exits the probe through the outlet ports back into the pipeline.

This self-cleaning design provides multiple advantages for the user:

**ADVANTAGES**

- Increased uptime and accuracy of your critical measurements
- Reliable protection of valuable analytical equipment from moisture
- Reduced maintenance time and expense due to self cleaning tangential cross flow filter design
- Large surface area membrane filter reduces plugging in high moisture/particulate applications
- In-situ filtration keeps particulates & moisture in pipeline; not in the sample line
- Quick response to changing process conditions when compared to dead-end filter designs

**TOP VIEW OF PROBE IN PROCESS** - Gas enters the TrueProbe™ at the sample inlet port facing the upstream flow. Two outlet ports on the side of the probe provide an exit path for the any condensed moisture back into the pipeline. The differential pressure between inlet and outlets creates high volume flow past the internal membrane filter.
**TrueProbe™ Sample Probe**

**TRUE SAFETY - BUILT IN**

High pressure, flammability, and toxic contaminants all pose safety risks to the operator dealing with natural gas. The TrueProbe™ has multiple safety innovations built into its design to ensure safe operation during sampling and maintenance.

The large, cross-flow Teflon membrane filter within the TrueProbe™ greatly reduces the need for maintenance compared to competitive dead-end designs due to its substantial surface area and fast-loop tangential sweeping design. Less maintenance requirements directly reduce the chance of operator exposure. Should cleaning or replacement of the filter be required, the TrueProbe™ provides an innovative retraction and sealing design.

Retraction of the TrueProbe™ from the process is accomplished with a 1” recessed hex connection on the top of the probe. Two turns of the hex connection isolate the filter from the process. Only after rotation of the hex nut can the internal filter tube be easily removed. This compact, mechanical design prevents a lengthy probe assembly which could bend or create trip hazards. No expensive pneumatic or electric actuators are required.

The in-situ membrane filter is protected by a unique block and bleed design. As the probe is retracted, internal o-ring seals block off the inlet/outlet ports from the process (figure 2). Any residual process gas captured within the probe is then bled off through the analyzer connection. After retraction, 11/16” wrench flats allow the sealed internal filter tube within the TrueProbe™ to be removed for cleaning or replacement. Universal Analyzers offers a wide variety of o-ring seal materials to ensure compatibility with your process.

**ADVANTAGES**

- Less maintenance, improved safety
- Internal block and bleed shut-off ensures safe filter maintenance
- Mechanical retraction ensure probe is isolated from process before a filter change can be performed
**TrueProbe™ Safety**

**Figure 2**

**OPEN**

(SAMPLE FLOW)

- 1" hex connection (Used for retraction)
- Mechanical stop (Removable for service)
- Double o-ring seals
- Dry, filtered gas for analysis

**RETRACTED**

(NO SAMPLE FLOW)

- 11/16" wrench flat (Used for filter removal)
- When retracted, all internal and external ports are fully sealed from the process by the o-ring seals used in block and bleed arrangement
- Outlet Ports not shown due to cutaway illustration

**TrueProbe™ Product Specifications**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Application</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Maximum Pressure Rating</strong></td>
<td>4000 PSIG (275 BAR)</td>
</tr>
<tr>
<td><strong>Temperature Range</strong></td>
<td>-20 to 200°F (-29 to 93°C)</td>
</tr>
<tr>
<td><strong>Physical</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sensor Body Material</strong></td>
<td>316 / 316L Stainless Steel NACE compliant to MRO 175/ISO 15156</td>
</tr>
<tr>
<td><strong>Filter Material</strong></td>
<td>Expanded Teflon</td>
</tr>
<tr>
<td><strong>Filter Area</strong></td>
<td>1.18 in² (4&quot; Sensor), 2.36 in² (7, 9, &amp; 12&quot; Sensor)</td>
</tr>
<tr>
<td><strong>Seal Options</strong></td>
<td>Viton Extreme, FFKM (Kalrez)</td>
</tr>
<tr>
<td><strong>Insertion Lengths</strong></td>
<td>4&quot; (101mm), 7&quot; (178mm), 9&quot; (229mm), 12&quot; (305mm) - Refer to page 4 for dimensions for actual insertion</td>
</tr>
<tr>
<td><strong>Process Connections</strong></td>
<td>3/4&quot; Male NPT (Standard), 1&quot; Male NPT - ANSI RF flanges available upon request consult factory</td>
</tr>
<tr>
<td><strong>Outlet Connection</strong></td>
<td>(1) 1/8&quot; Female NPT</td>
</tr>
</tbody>
</table>
**TrueProbe™ Product Selection Guide**

**TrueProbe™ Style**
- **TRUE** Integrated Fastloop, In-Line Isolation and Cross-Flow Membrane Filter

**Probe Length**
- 4" Probe (4.1" Insertion Length), 1.5" Filter Length
- 7" Probe (6.8" Insertion Length), 3" Filter Length
- 9" Probe (8.7" Insertion Length), 3" Filter Length
- 12" Probe (11.7" Insertion Length), 3" Filter Length

**O-Ring Material**
- **V** Viton Extreme ETP
- **K** FFKM (Kalrez)

**Cross-Flow Filter Material**
- **T** Teflon

**Process Connection**
- 0.75 3/4" Male NPT Connection (Std)
- 1 1" Male NPT Connection

**TrueProbe™ Dimensions**

<table>
<thead>
<tr>
<th>Probe Length</th>
<th>4&quot;</th>
<th>7&quot;</th>
<th>9&quot;</th>
<th>12&quot;</th>
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</thead>
<tbody>
<tr>
<td>&quot;A&quot; Overall Length</td>
<td>7.62&quot;</td>
<td>10.25&quot;</td>
<td>12.25&quot;</td>
<td>15.25&quot;</td>
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<tr>
<td>&quot;B&quot; Dimension</td>
<td>4.15&quot;</td>
<td>6.78&quot;</td>
<td>8.78&quot;</td>
<td>11.78&quot;</td>
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<tr>
<td>&quot;C&quot; Dimension</td>
<td>3.18&quot;</td>
<td>5.81&quot;</td>
<td>7.81&quot;</td>
<td>10.81&quot;</td>
</tr>
</tbody>
</table>

Located in Carson City, Nevada USA, Universal Analyzers produces the finest Gas Sample Conditioning Equipment available in the world. We design, manufacture, market, and service all of our products entirely from our facility. Universal Analyzers is a wholly owned subsidiary of Ametek. Ametek has nearly 14,000 colleagues at over 120 manufacturing locations around the world. Supporting those operations are more than 80 sales and service locations across the United States and in more than 30 other countries around the world.

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