On-Line Measurement of Dissolved Solids

COMPATIBLE WITH EXISTING LSC SENSORS

FEATURES: USER FRIENDLY INTERFACE ON A TOUCHSCREEN, USB PORT, ACCURATE & FASTER PROCESSING, ETHERNET CONNECTION, ADJUSTABLE LED REFERENCE, GRAPH DISPLAY OF DIAGNOSTIC DATA AND MORE.

LIQUID SOLIDS CONTROL INC.
Model 326 Introduction

Liquid Solids Control is stepping out front, once again, with the Model 326 Refractometer. It offers a large 8.4" LED Touch-Screen Display, as well as an Ethernet connection for remote access via a web browser (we recommend Firefox). Providing a direct link to all of the instrument’s information, the Model 326 gives the customer the flexibility and convenience of interfacing with the unit from any location within the plant's network (instrument shop/maintenance shop, control room, etc.). Furthermore, when needed, your IT department can set-up a VPN allowing the LSC factory to troubleshoot your refractometer remotely, saving you time and money. For customers that do not have their instruments networked, we have incorporated a USB port which allows the technician to off-load all diagnostic files (history, event alarms and calibration files), so that they can be e-mailed to LSC for troubleshooting assistance.

Engineers/Technicians will simply touch the large, user-friendly icons to change and/or view any of the parameters of the refractometer.

Multiple-level, customer-defined password protection allows limited access to key operational and diagnostic functions.
Liquid Solids Control provides solutions for all installations. A variety of end fittings and flanges are readily available to complement the Model 326 process refractometer.

**Sanitary Sensor**

The In-Line Sensing Head is designed for sanitary applications. It is encased in a strong, waterproof (sealed) stainless steel housing and is completely maintenance free.

**Prism Wash Sensor**

The In-Line Prism Wash Sensing Head comes with an industrial wash nozzle and check valve. This ensures the prism stays clean on tough applications.

**Insertion Probe**

The probe is designed to be installed on tanks, vacuum pans and large pipe lines. They can be supplied with industrial or sanitary flanges. A prism wash nozzle is available when required.

**Flow Cells and End Fittings**

**Pipe Section**

The Pipe Section is used to mount our in-line sensing head directly into the process line. They are available from 3” to 18” in diameter and can be supplied with or without industrial flanges (ANSI, DIN, JIS).

**Valve Body**

The Valve Body is typically 2” to 4” in diameter and with industrial flanges for general industry use, or sanitary flanges for use in food processing applications.

**Flow-Thru-Block**

The Flow-Thru-Block is used in smaller process lines from 1/8” to 3” diameter. Threaded NPT Female connections, Industrial Flanges and Sanitary Tri-Clover Flanges are available.

www.liquid solidscontrol.com
The Model 326 Process Refractometer can be used to improve the entire efficiency of the “Kraft” liquor process, from the brown-stock washers, through the multiple-effect evaporators, concentrator, recovery boiler and even the dissolving tank.

Key Facts:

- Optimizing consumption of pulp chemicals.
- Improve capacity of Evaporator/Concentrator.
- Increase Recovery Boiler run-time and safety.

Typical Applications:
- Heavy black liquor solids
- Weak black liquor solids
- Red liquor solids
- Stock washer
- Caustic dilution
- Green Liquor

Gate Adaptor

The Liquid Solids Control Gate Adaptor provides the means for simple and quick removal of a sensing head from an active black liquor process pipeline, while ensuring the ultimate in safety. This dedicated unit eliminates the need for costly “By-Pass Loops”, which tend to be a bother by either leaking or plugging and even unscheduled process line shutdown to allow for maintenance.

The gate adaptor (duplex 2205) employs a completely captive slide plate, mechanically sure, operated by an eccentric cam. Operation of the Gate Adaptor is accomplished by turning a 1” (25 mm) hex operator just under 1/2 turn. Double Teflon seals are provided against both sides of the slide plate.

The Gate Adaptor provides for an external lock “fully open” or locked “fully closed” additionally providing positive and physical indication of “fully open” or “fully closed”.

Prism Wash

The Model 326 Transmitter can be programmed to wash the sensing window (prism) on a time basis with steam or water. The 326 incorporates Smart Wash Technology, which means it monitors itself and self-adjusts to wash for only “as long as necessary”, eliminating most prism wash maintenance problems.
The LSC Model 326 offers accurate in-line concentration measurements in the chemical, petrochemical and other various industrial process applications. Continuous monitoring enables uniform product quality and minimizes waste, as well as provides instant feedback on any process changes.

Linear and Non-Linear Applications

There are hundreds of ideal applications for process refractometers within the chemical and petrochemical industries. Some process measurements are linear, and some are not. The Model 326 has the ability to linearize/shape, or reverse, any customer’s product characteristics. This allows the process refractometer to track and produce accurate concentration measurements of products with a non-linear refractive index curve. Multiple linearized calibration tables may be stored and selected, as required. If desired, the measurement units, calibration, and correction points can selectively be changed at will, via the user-friendly touch-screen or remote web browser interface. The 4-20 mA output signal is automatically calibrated to the selected measurement range.

Intrinsically Safe Installations

Through the use of intrinsic safety barriers, the LSC Model 326 Sensing Head (either the in-line style or insertion probe) can easily be operated in a hazardous area, being intrinsically safe to the highest level. The sensing head is classified as a “Simple Apparatus”. Our system’s unique design allows for the sensing head to be located up to 500 feet (150 meters) away from the electronic enclosure. This exclusive feature eliminates various cumbersome problems associated with distance limitations that can occur when using other process instruments. The flexibility of the Model 326 allows the user to locate the electronics enclosure in the most convenient “safe zone”.

www.liquidsolidscontrol.com
Food, Dairy & Sugar Industries

The most important aspect of “Quality Control” is to maintain optimum product consistency. Doing so will have many positive benefits, among them: consistent end product, maximum energy efficiency and an increased production capacity.

Typical Applications:
- Various tomato products
- Applesauce, fruit syrups
- Various jams & jellies
- Gelatin
- Various candy products
- Various milk products
- Various cheese products
- Yogurt, yogurt with fruit
- Syrups, sucrose, corn, etc.
- Crystallization (Vacuum Pan)
- Molasses

Evaporator Installation

One of the most common applications would be on a multiple-effect evaporator; where the customer installs a refractometer on the input and output of the evaporator. The 4-20 mA output supplied by the LSC Brix meter will be connected to the customer’s PLC / Control System and from there an automatic control valve would increase or decrease the flow through the evaporator, ensuring the end product is always within the product’s specifications.

Tank Installation

The Model 326 Insertion Probe is most useful for blending and mixing batch processes. This could be jelly pans, sugar pans or even reaction-type processes.
All flow cells that Liquid Solids Control manufacture are tailor-made to the requirements of the customer’s installation. This includes the line size, connection type and material. Typical length for single flanged pipe sections is 18" face to face. Dual pipe spools are 28".

**Model 326**
10 lbs. / 4.5 kg.

**In-Line Sensing Head**
7 lbs. / 3.2 kg.

**4" Insertion Probe**
5 lbs. / 2.3 kg.

**Gate Adaptor**
15 lbs. / 6.8 kg.
# LSC Model 326 Technical Specifications

<table>
<thead>
<tr>
<th>Input Power Required</th>
<th>100 to 240 VAC, 50/60 Hz, &lt; 25 Watts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refractive Index Range</td>
<td>1.3000 - 1.6000</td>
</tr>
<tr>
<td>% Solids or Brix Range</td>
<td>0 - 100</td>
</tr>
<tr>
<td>Span (calibration)</td>
<td></td>
</tr>
<tr>
<td>Ri</td>
<td>Minimum 0.0015  Maximum 0.2000</td>
</tr>
<tr>
<td>Brix</td>
<td>Minimum 1.0  Maximum 85.0</td>
</tr>
<tr>
<td>Solids*</td>
<td>Minimum 1%  Maximum 100%</td>
</tr>
<tr>
<td>*May vary with some process materials or applications</td>
<td></td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.5% of selected span range</td>
</tr>
<tr>
<td>Repeatability</td>
<td>0.1%</td>
</tr>
<tr>
<td>Speed and Response</td>
<td>500 milli-seconds</td>
</tr>
<tr>
<td>Process Temperature Range</td>
<td>-25° to 150° C</td>
</tr>
<tr>
<td>Temperature Compensation</td>
<td>Automatic (Can be calculated for any range)</td>
</tr>
<tr>
<td>Process Line Pressure</td>
<td>Up to 1000 PSIG (68 Bar)</td>
</tr>
<tr>
<td>Interconnecting Cable Length</td>
<td>1,500 feet maximum (455 meters)</td>
</tr>
<tr>
<td>Process Measurement Outputs</td>
<td>Standard and included</td>
</tr>
<tr>
<td></td>
<td>Isolated 4 - 20mA DC, (15 V compliance)</td>
</tr>
<tr>
<td></td>
<td>Isolated 0 - 10 VDC</td>
</tr>
<tr>
<td>Optional Local Display</td>
<td>8.4&quot; Touch Screen (800x600 RES)</td>
</tr>
<tr>
<td>Remote Communication</td>
<td>Web Browser via Ethernet</td>
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<tr>
<td>Process Temperature Output</td>
<td>0 - 10 VDC</td>
</tr>
<tr>
<td>Diagnostic Port</td>
<td>RS-232</td>
</tr>
<tr>
<td>Alarm Set Points</td>
<td>LO / HI or</td>
</tr>
<tr>
<td></td>
<td>OUT OF SPEC / SYSTEM</td>
</tr>
<tr>
<td></td>
<td>Relays normally energized or normally not energized</td>
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<tr>
<td></td>
<td>LO / HI set points are fully adjustable</td>
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<tr>
<td>Prism Wash</td>
<td>Automatic “Settable”</td>
</tr>
<tr>
<td>Wetted Material</td>
<td>Duplex 2205, 316SS, Alloy 20, Hastelloy-C, Tellons, Other materials available upon request</td>
</tr>
<tr>
<td>Prism</td>
<td>Sapphire (Highest Industrial Grade)</td>
</tr>
<tr>
<td>Processor Enclosure</td>
<td>Polypro Nema 4X Enclosure with SS Latches</td>
</tr>
<tr>
<td>Electronic Enclosure Ambient Temp.</td>
<td>Up to 50° C</td>
</tr>
</tbody>
</table>

**NOTES:**

(1) 2205 Duplex and 316L Stainless Steel are used as our standard wetted material. Many other materials are available for specialty applications.

(2) Due to ongoing Research and Development and product improvement, all specifications are subject to change.

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**TWO YEAR WARRANTY**

The Model 326 Process Refractometer manufactured by Liquid Solids Control, Inc. is warranted against any/all defects in materials, components, and workmanship for a period of two (2) years from the date of shipment. In the unlikely event that this product proves to be defective during the warranty period, return it to Liquid Solids Control, Inc., and it will be, at our discretion, repaired or replaced free of charge for both labor and parts.