

ON-LINE MEASUREMENT OF DISSOLVED SOLIDS

# PROCESS REFRACTOMETER

Measurements Without Limits

MODEL 614



# LSC

LIQUID SOLIDS CONTROL, INC.

## ADVANCED AND INNOVATIVE FEATURES

Another Industry 1st ... The Model 614 has its own 3.5" Floppy Disk Drive.

Program/Calibration/Event & History Files can be saved to a floppy disk. Program/Calibration Files can be transferred between other Model 614s.

History & Event Files can also be e-mailed for Factory Troubleshooting Assistance.

Will display continuous Trend of Process Measurement, and Process Temperature. Can be easily "off-loaded" (via the Floppy) for various customer reasons, including spreadsheets and plots, and long term storage.

Unique "User Friendly" Operating Menu.

Supports an unlimited number of Customer "Program/Calibration/Set-Up" Files.

Extensive internal "Self Diagnostics".

Ability to Linearize/Shape, or Reverse, any customer product characteristics.

Smart Wash Technology . . . Monitors itself and self-adjusts to wash for only "as long as necessary" . . . eliminating prism wash maintenance problems.

Automatic Temperature Compensation (Over any range).

Multiple Language Menu.

Dual Alarm Contacts.

### OPTIONS/ACCESSORIES:

Remote Control w/ Display... change Customer Program/Calibration Files and the Zero "offset", from a remote location (up to 3 Km), via the 2 wire RS-485 connection.

Gate Adaptor... Simple Compact Isolation Valve.

Intrinsic Safety Barrier ... see back page

Model 614 ... for continuous, in-line measurement of CONCENTRATION, BRIX, % SOLIDS, RI, ETC.

Most User Friendly! Incorporates Numerous *Unique* and *Useful* features while attaining the highest pinnacle of reliability and accuracy. Combining the *Infinite Resolution Detection System* and the internal computerized electronics, accuracy has been brought to virtually "no error", at any point, across any measurement range. Another Industry 1st ... No longer an actual need for an "Accuracy Specification".

The measurement is displayed in the most useful terms.

Calibration file(s) can be labeled with actual product name . . . example Hydrochloric Acid

Large graphic "Vacuum Fluorescent" display

When Two Heads are better than one... Choose the LSC Model 614 X2. Provides two separate & independent measurements from the same processor.



Temperature status displayed ... also has it's own output.

Prism wash status displayed... Unit incorporates "Smart Wash Technology"

Stainless Steel Nema-4X enclosure provides maximum protection and meets sanitary requirements.

Unique 5 button touch pad allows all calibration and diagnostic information to be accessed easily ... No need to go into the enclosure. No trimpots/dials/adjustments

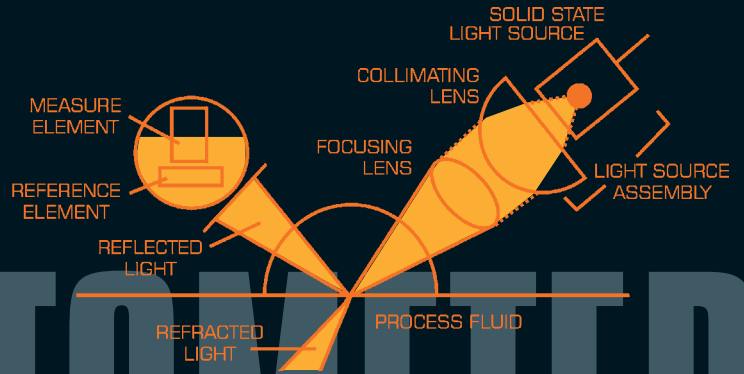
The fully computerized LSC Model 614 Process Refractometer is a two-piece optical/electronic in-line measurement instrument. It is currently available as a 614 X1 Single Sensor, or as a 614 X2 Dual Sensor configuration.

## I.R. DETECTION SYSTEM...

Provides Infinite Resolution  
while eliminating drift.

The highest quality and absolute hardest Sapphire "hemisphere" sensing window (prism) allows all calibration ranges with the same prism.

The sensor(s) is mounted in a manner to ensure the Sapphire Prism is in direct contact with the process. The wetting of the prism face provides the physical properties necessary for the "critical angle measurement". At the interface, light is reflected & refracted off the process, at different angles, depending on the refractive index level (optical density) of the process fluid.



# REFRACTOMETER

VERSATILITY AT ITS BEST

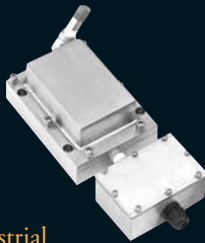
Extended Insertion Probe...  
The Probe can be manufactured to any length as specified by the customer.

Insertion Probe with  
Sanitary Wash Nozzle.

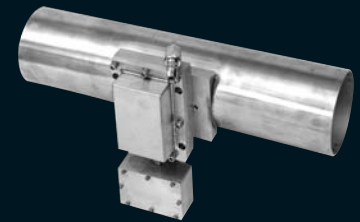


Our sensors are designed to meet any industrial and/or any sanitary requirement. Sensing heads are encased in a rugged, waterproof (o-ring sealed) stainless steel housing, and are completely maintenance free. Inside, nothing is settable, nothing is adjustable.

In-Line Sensing  
Head with Industrial  
Prism Wash.

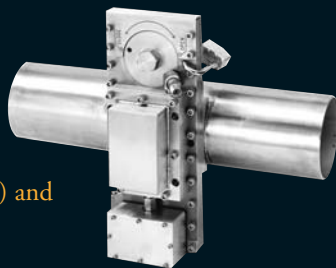


LSC provides solutions for all installations. The In-line Sensor can be mounted on a 1/8" process line up to an unlimited size line. When tanks or process vessels are the required installation, the Insertion Probe should be installed. A variety of end fittings and flanges are readily available.

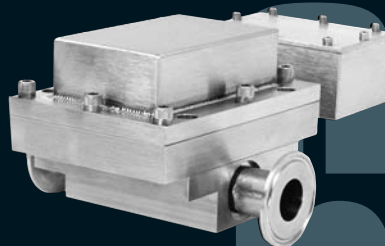


Direct Weld-In Pipe Section  
with In-Line Sensing Head.

Pipe Section with Gate  
Adaptor (Isolation Valve) and  
In-Line Sensing Head.



Sanitary Flow-Thru-Block with  
Sanitary Tri-Clover Connections.



Sanitary Standard Accepted

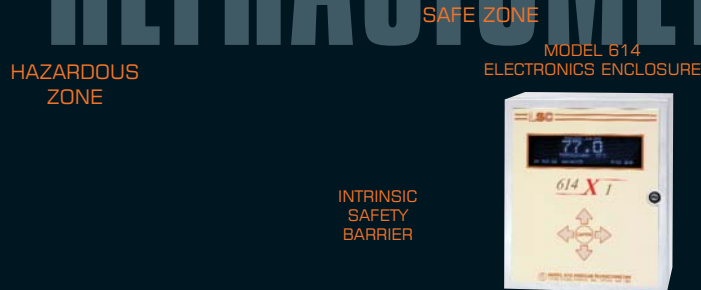


Note: Our standard material is 316L Stainless Steel. We can supply our products in other various "exotic" materials, such as Hastelloy B/C, Tantalum, Alloy 20, Titanium, Kynar, Teflon, etc. or others, as required by customer.

## INDUSTRIES WITH APPLICATIONS

Pulp & Paper Industry • Sugar Industry • Chemical Industry  
Food & Beverage Industry • Dairy Industry • Miscellaneous Industry

# PROCESS REFRACTOMETER



The Model 614 sensors can easily be operated in a hazardous area, being intrinsically safe, through the use of Intrinsic Safety Barriers.

### LSC MODEL 614 TECHNICAL SPECIFICATIONS

Input Power: 85 to 260 VAC, 50/60 Hz, < 25 watts  
(Automatic Sensing of Input Power)

Refractive Index, overall spectrum: 1.3000 to 1.6000  
% Solids, or Brix, overall spectrum: 0 to 100 %

		Minimum	Maximum
Span (calibration)	RI	0.0015	0.2000
	Brix	1.0	85
	Solids*	1%	100%

\* May vary with some process materials or applications

Accuracy: (basic/uncorrected): +/- 0.5 % of selected Span Range  
Accuracy: (internal computer assisted): +/- 0.0  
(virtually no error, any point, over any calibrated range)

Drift specification: No detectable or measurable drift with time

Sensing Prism: Sapphire 'Hemisphere' ... hardest possible

Speed of response: 0.5 sec.

Process temperature range: - 25 to 150 Deg. C

Temperature Compensation: Automatic (Can be calibrated for any range)

Process Temperature Output: 0 - 10 VDC  
(corresponding to temperature range setting of the Model 614)

Process Line Pressure: Can be up to 1000 PSIG (68 Bar)

Interconnecting Cable: Any Length, up to 1625 ft. (500 meters)

Process Measurement Outputs: Isolated, 4 - 20 mA DC,  
and 0 - 10 VDC

Dual Alarm Contacts: Both fully adjustable, as to 'action',  
and/or 'function'

A: Drive: Standard 3.5" Floppy Disk Drive

Diagnostic port: RS-232  
Communication: RS-485

Electronic Enclosure: Environmentally Proven NEMA 4X SS  
Electronic Enclosure Ambient Temperature: up to 45 Deg. C

Sensing Head(s): 316L SS, sealed against any moisture/condensation

### FIVE YEAR WARRANTY

The Model 614 Process Refractometer, manufactured by Liquid Solids Control, Inc., is warranted against any/all defects in materials, components, and workmanship for a period of five (5) 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.

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