

# E-SCAN EVO

Electronically-scanning *EVO*lution In-Line Refractometer



ELECTRON MACHINE  
CORPORATION

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# E-SCAN *EVO*



## The next *EVO*lution of refractometer

The E-Scan *EVO* is a flexible and intelligent electronically scanning critical angle refractometer platform. Built on a future-ready modular architecture, it maintains full backward compatibility with previous MPR E-Scan refractometer systems provided by Electron Machine since 1995.

Representing the next evolution in in-line refractive index measurement, the E-Scan *EVO* delivers accurate, real-time analysis of process fluids and directly correlates to dissolved solids, percent concentration, °Brix, and other critical process parameters. The system can function as a standalone process monitor or serve as an integral component of a complete process control solution.

Building on decades of proven performance, the E-Scan *EVO* combines the reliability customers have trusted for years with powerful new advancements, including modular upgrade capability, enhanced diagnostics, intelligent cleaning features, and an intuitive user interface. Each system is factory calibrated for its specific application to ensure fast, precise, and dependable performance from startup onward. Engineered for demanding industrial environments, the E-Scan *EVO* is packaged in a rugged design built to withstand the harshest operating conditions.

At Electron Machine, we have led the industry since patenting the world's first in-line refractometer in 1957. That heritage of innovation drives everything we build. The E-Scan *EVO* is the latest expression of that commitment, representing decades of application expertise and customer trust engineered into a platform ready for the next generation of process control.

## **Backwards Compatible. Future Ready.**

The E-Scan *EVO* is designed for long term performance, adaptability, and continuous improvement. Built on decades of industrial refractometry experience, it maintains compatibility with existing Electron Machine systems while providing a flexible platform for future technology advancements.

To simplify upgrades and service, all major processing components are housed within the Door Assembly. The platform also incorporates dual microcontrollers operating in continuous communication to enhance system reliability and maintain stable performance.

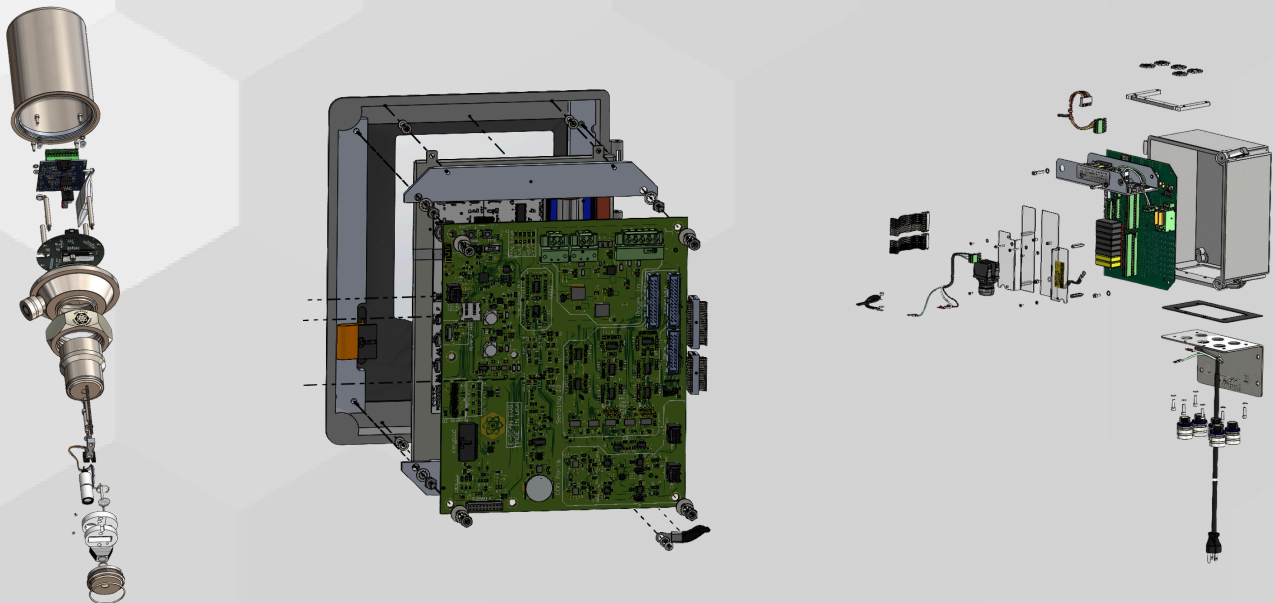
With built in expansion capabilities for communication protocols and analog and digital input/output options, the E-Scan *EVO* is engineered to evolve alongside changing process requirements, helping protect your investment for years to come.

## **Measurement: Simple. Rugged.**

The E-Scan *EVO* measures the refractive index of process liquids using a proven optical system housed within a rugged Sensing Head. Designed with no moving parts and built from durable, long lasting components, the system delivers accurate and reliable performance in demanding industrial environments.

Changes in refractive index are detected by a CCD array, while precision engineered stainless steel construction helps maintain optical alignment and prevent measurement drift, ensuring long term stability and accuracy.

Initially available with our hybrid digital Sensing Head technology, the platform combines proven measurement performance with a future ready architecture designed to support emerging digital technologies as they evolve.





## Application Specific

The E-Scan *EVO* provides the process insight needed to improve control, increase efficiency, and enhance product consistency. By delivering accurate real time measurement data, the system helps manufacturers optimize production, reduce waste, lower operating costs, and improve overall profitability.

With decades of industry experience, Electron Machine provides more than just instrumentation. We deliver the application knowledge, technical expertise, and responsive support needed to help customers maximize performance and achieve long term value from their process investment.

### Pulp & Paper Industry

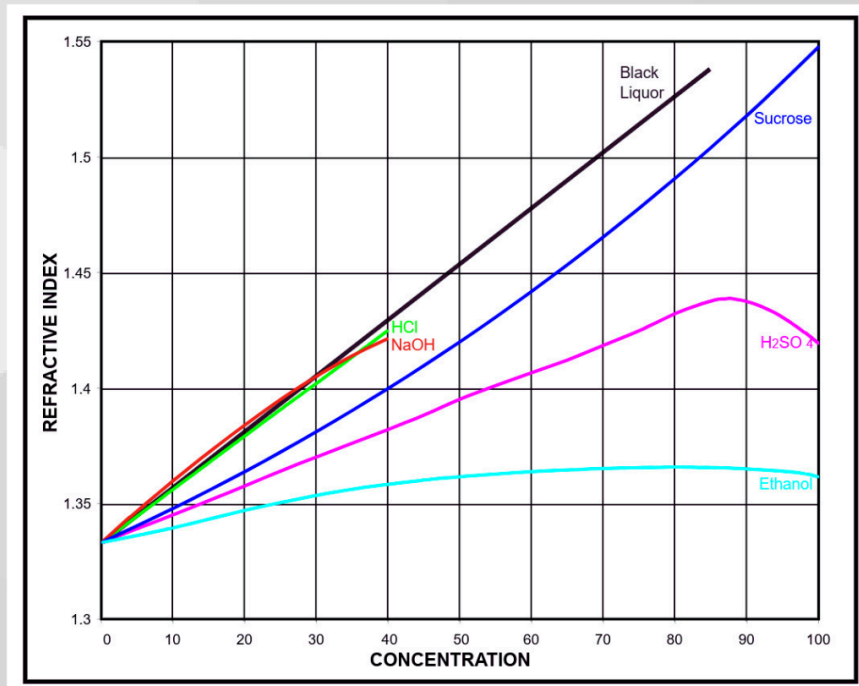
Black Liquor: Pulp/Brownstock washing, Evaporators, Concentrators, Firing Liquor  
Green Liquor: Weak wash, Raw Liquor from Dissolving Tank, Clarified Green Liquor  
White Liquor, Starch/Sizing Liquid, Tall oil, Sulfuric Acid, Bleach, Caustic

### Food Industry

Sugar: Syrups, Sucrose, Fructose, Dextrose, Crystallization, Molasses  
Foods: Tomato Paste, Jams & Jellies, Gelatin, Applesauce, Fruit Syrups, Candy  
Beverage: Soft Drinks, Fruit Juice, Juice Concentrates, Beer, Spirits, Coffee  
Dairy: Milk, Milk Products, Cheese Products, Yogurt

### Chemical/Petroleum/Pharma Industries

Sulfuric Acid, Hydrochloric Acid, Phosphoric Acid, Boric Acid, Nitric Acid, Oleum  
Alcohol, Ethanol, MEK, Urea, NMP, DMAC, DMSO, PVOH, PVA, Caustic, Caustic Soda  
Sodium Hydroxide, Sodium Carbonate, glycol, Glycerine, Salt, Machine Coolants





## Intuitive Operation

The E-Scan *EVO* combines advanced functionality with a user-friendly interface designed to simplify operation and keep processes running smoothly. Process readings, operating parameters, diagnostic data, purge logs, and product settings are organized for quick access, allowing operators to navigate the system confidently with minimal training.

Routine tasks can be completed in seconds. Matching laboratory measurements and verifying process conditions are straightforward operations that fit naturally into an operator's workflow. Settings can be adjusted at any time through the system's intuitive menu structure, with multi-layer password protection ensuring the right people have access to the right controls.

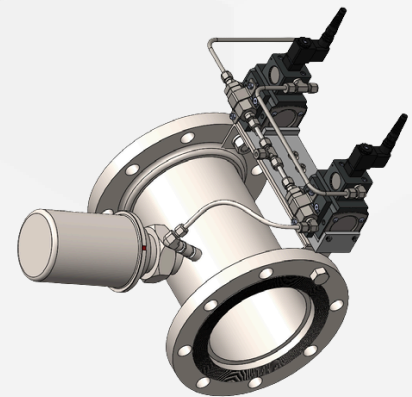
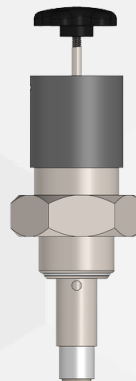
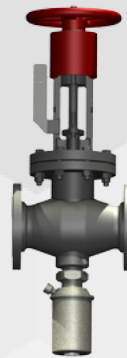
Each system is factory configured and optimized for its intended application before shipment, drawing on decades of real-world process experience to ensure operators are productive from day one.



## Process Integration

The E-Scan *EVO* offers a wide range of process adapters and cleaning solutions designed to maximize measurement reliability across a variety of industrial applications. Developed through decades of application experience, these solutions help ensure proper installation, maintain a clean process interface, and support long term system performance.

To reduce maintenance requirements and improve measurement consistency, the E-Scan *EVO* incorporates design features that minimize buildup on critical sensing surfaces. For more demanding applications, optional cleaning systems are available to extend maintenance intervals, reduce downtime, and help ensure dependable operation in challenging process conditions.



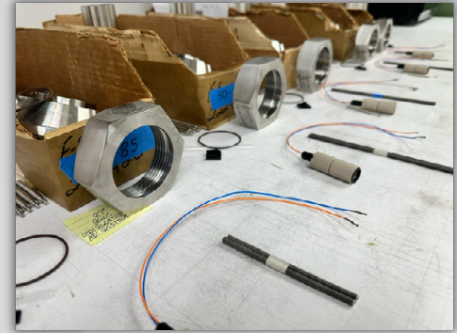


## Engineered for Harsh Environments

The E-Scan *EVO* is built to deliver reliable performance in demanding industrial environments, including exposure to corrosive fumes, high temperatures, spraying liquids, and vibration.

The Transmitter is constructed from molded fiberglass polyester and carries a NEMA 4X rating, allowing for outdoor installation without additional protection. An externally accessible interface enables operation without exposing internal electronics to the environment, while stainless steel fittings and a rugged mounting bracket provide secure, long term durability.

The Sensing Head is engineered for corrosion resistance and measurement stability. All external components are stainless steel, and all process wetted components are constructed from 2205 Full Duplex stainless steel, PTFE, and sapphire as standard, providing exceptional durability and long term reliability.



## Designed for Reliability

The E-Scan *EVO* is engineered for long-term reliability, serviceability, and minimal downtime. Its robust construction and modular design simplify troubleshooting and support efficient field repairs using basic hand tools. Advanced diagnostics help identify potential issues early, before they become costly problems.

When additional assistance is needed, Electron Machine is ready to respond. Our 24/7 technical support line is monitored by trained technicians who provide fast, knowledgeable assistance. We also maintain a full inventory of replacement components for rapid shipment and offer experienced field engineers for on-site repairs, technical support, and customer training.

This combination of intelligent design, responsive support, and readily available service resources helps maximize uptime and delivers long-term value throughout the life of your system.





## Warranty

Electron Machine Corporation stands behind the quality and reliability of every system we manufacture. EMC warrants that all equipment is free from defects in materials and workmanship for a period of two years from the date of shipment from our factory. If a defect is identified during this period, EMC will repair or replace the defective component upon prepaid return of the component to our facility. This warranty does not apply to equipment that has been modified, misused, or subjected to abuse.

The E-Scan *EVO* is also backed by a process performance guarantee, ensuring the system will meet or exceed all written performance specifications. This commitment reflects our confidence in every system we ship and our dedication to your long-term success.

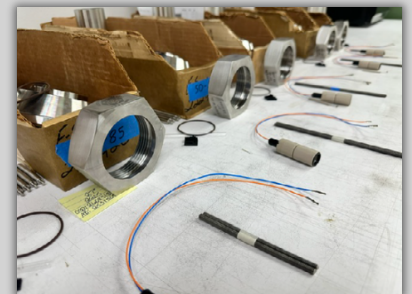


## About Us

Electron Machine Corporation is a leader in industrial in line refractometry, delivering rugged, reliable, and accurate process measurement solutions for customers around the world. As the pioneer of the first industrial in line process refractometer, Electron Machine has advanced process control across the food and beverage, chemical, pharma, and pulp and paper industries with thousands of installations worldwide.

Founded in 1946 by Carl Vossberg Jr., Electron Machine combines decades of engineering innovation with a commitment to long term reliability, responsive customer support, and continuous product development. Headquartered in Umatilla, Florida, the company designs and manufactures its instrumentation in-house, allowing complete control over quality, production, and service.

Today, Electron Machine continues to build on its legacy of innovation by developing durable, future ready technologies that deliver dependable performance in the most demanding industrial environments.





# Specifications

ACCURACY	±0.0002 RI min (typ. 0.1% by weight) to ±0.000075 RI max
REPEATABILITY/STABILITY	Corresponds to accuracy
SPAN	Configured for specific application for max accuracy
RESPONSE TIME	0.25 seconds to 15 minutes
PROCESS TEMPERATURE	-40° to 150°C (-40° to 300°F) without air purge
AMBIENT TEMPERATURE	Sensing Head: -40° to 52°C (-40° to 125°F) without air purge Console: -20° to 50°C (-4° to 120°F) without cooling
DISPLAY	10.1" TFT with LED backlighting, 1000cd/m <sup>2</sup> brightness 1280x800 pixel, full viewing angles (IPS)
INTERCONNECTING CABLE	6M (20FT) standard 300M (1,000FT) maximum
SENSING HEAD . WETTED MATERIALS	2205 Duplex S/S, Sapphire, PEEK®, VITON® (other alloys & elastomers available on request)
STANDARD OUTPUTS	4-20mA non-isolated, 0-10 Vdc non-isolated (6) configurable output relays (A/C or D/C) (2) configurable input relays (A/C or D/C)
POWER	85-260Vac, 50/60Hz, 50VA (24Vdc optional)



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