

Easy, fast and simultaneous pH and conductivity measurements



Thermo Scientific Gallery and Gallery Plus discrete analyzers with integrated photometric and electrochemical measurement

Just two measurements for a world of insight

pH and conductivity measurements provide crucial insight for a range of industries, including the food and beverage, industrial process, enzyme kinetics and water analysis sectors. Fast, accurate and cost-effective pH and conductivity measurement workflows create the stream of regular, meaningful data that drives important decisions. By regularly testing all parameters of a manufacturing line, process problems are detected early, enabling intervention and improvements that protect equipment, product consistency and quality standards. In turn, the collection of accurate and timely data provides evidence for regulatory approval and audit submissions.

With the integrated electrochemical measurement (ECM) module, the Thermo Scientific™ Gallery™ and Thermo Scientific™ Gallery™ Plus discrete analyzers provide complete photometric testing along with parallel, automated electrochemical measurement of pH and conductivity.

Just two measurements for comprehensive, cross-industry insight.



Food and beverage

Measure, monitor and maintain pH to:

- Ensure product stability
- Increase antimicrobial effects of sulfur dioxide
- Maintain taste consistency and equilibrium to meet brand requirements
- Maintain favorable enzyme kinetics
- Detect spoilage
- Ensure regulatory compliance

Measure conductivity to:

- Protect manufacturing equipment from corrosion or scale build-up
- Maintain taste profile



Water analysis

Measure pH to:

- Protect equipment from acid corrosion
- Detect viral activity

Measure conductivity to:

- Quantify total dissolved solids
- Protect against scale build-up
- Ensure environmental discharge standards are met
- Create detailed inorganic profiles for regulatory compliance



Enzyme analysis

Measure pH to:

- Detect optimal pH range for activity

Measure conductivity to:

- Determine ionic strength

Parallel photometric and electrochemical testing saves time, reduces costs and improves throughput

Traditional wet chemistry techniques have been used for years to evaluate pH and conductivity levels, but these are slow and labor-intensive. Highly skilled scientists are needed to run sequential tests, each measuring a single sample and parameter. Manual handling of large volumes of hazardous chemicals adds substantial costs and health and safety risks.

Together, these restrictions create bottlenecks where laboratories struggle to keep up with demand. Delays in testing can mean important indicators are missed. If not addressed, this leads to increased spoilage rates, regulatory non-compliance and risks to equipment and downstream processes.

But there is a simple solution.

The integrated ECM module is a common upgrade to the Gallery and Gallery Plus discrete analyzers, providing both pH and conductivity testing in parallel to the comprehensive range of photometric measurements.

Laboratories can now:

- Use a single, automated instrument to consolidate wet chemical analysis
- Reduce hands-on analysis time
- Decrease the time taken to run samples
- Improve test precision and accuracy
- Increase laboratory testing capacity



To deliver:

- Improved and more frequent data to production and process teams
- Accurate insight for better decision-making
- Walk-away time for scientists to complete value-added tasks



Integrated ECM for automated calibration, verification, and up to 67 ECM tests per hour

The integrated ECM module is commonly chosen as an upgrade to both the Gallery and Gallery Plus discrete analyzers. This small unit simply slots into place and provides both electrochemical pH and conductivity tests in parallel to the full range of photometric measurements. Parallel workflows ensure multiple tests can be conducted on one sample, saving time and reducing reagent volume and sample waste. Within the ECM module, two electrodes work in series to measure sample conductivity and pH simultaneously. The entire process takes less than one minute, enabling up to 67 electrochemical tests to be completed per hour, alongside 350 photometric tests.



Measuring ranges	
pH	2-12
Conductivity	20 μ S/cm-112 mS/cm
ECM tests per hour	Up to 67

The high sensitivity and versatility of the ECM module ensures that a wide range of sample types can be analyzed from many different industries, including food and beverage, industrial process, water analysis and enzyme kinetics sectors.

Each measurement takes place at 37°C as standard but can be reported at a range of temperatures through correlation to reference analyzer results. Since every ECM module features automatic calibration, testing time is further reduced and result accuracy improved.

No matter the industry, regulatory compliance is a must for all laboratories. By creating fully auditable, regulatory-ready results, processes can be streamlined and time-consuming data work minimized. The pH and conductivity measurements completed within the ECM module are automatically verified using National Institute of Standards and Technology (NIST) traceable standards and comply with the latest regional and international standards.

ECM measurements are compliant with the following regulatory standards

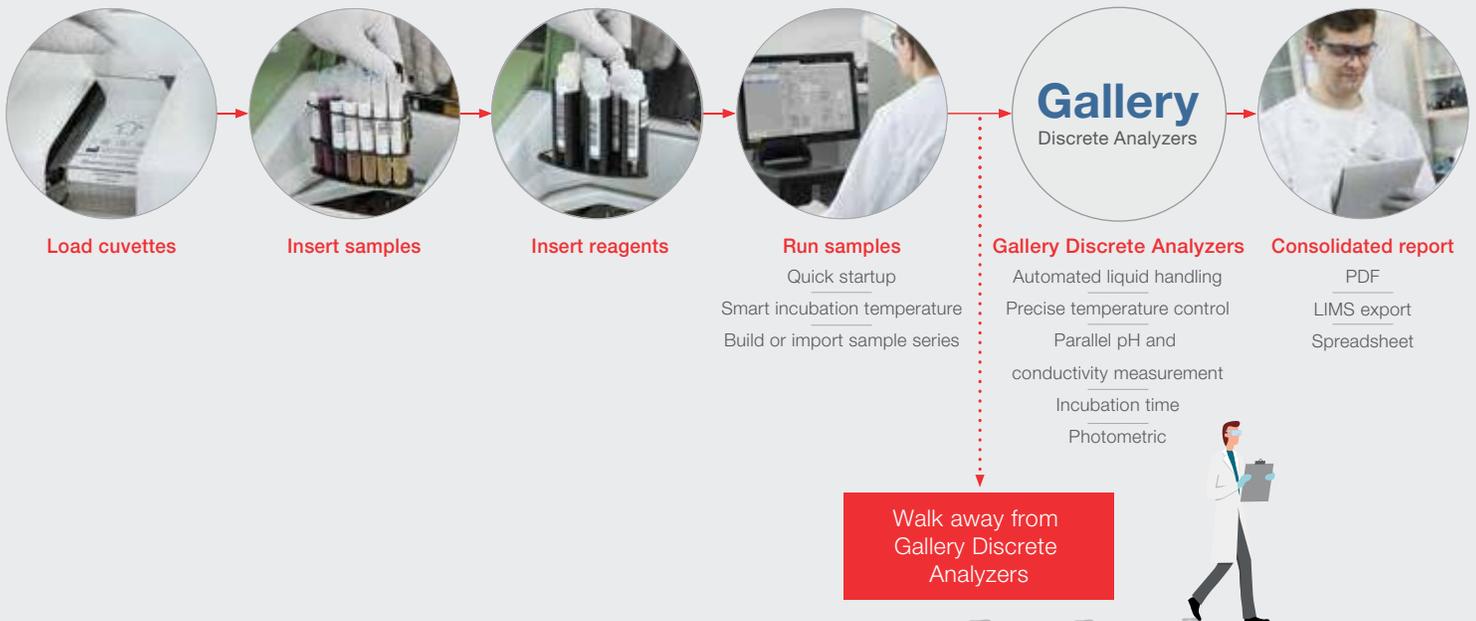
pH	Conductivity
EPA 150.2	EPA 120.1
ASTM - D1293 (A,B)	ASTM - D1125 (A)
ISO-10523	ISO- 7888
AOAC – 973.41	AOAC- 973.40
SM-4500-H+(B)	SM-2510 (B)

Fully-integrated and automated workflows for every testing parameter



Because the ECM module is fully integrated with the standard photometric workflows offered by the Gallery analyzers, one combined system can provide all testing parameters needed to support food and beverage manufacturing, industrial processes and environmental water analysis.

Simple workflows ensure fast, accurate results with true walk-away time, freeing scientists to complete value-added tasks. With ready-to-use reagents, multiple sample uploads and simple table imports, the discrete analyzer can be set up in a matter of minutes, running photometric and electrochemical tests and collecting all results in a consolidated, export-ready report.



Proven accuracy and precision

Gallery and Gallery Plus discrete analyzers, with the integrated ECM module, are proven to deliver precise and accurate results for both pH and conductivity for a range of food and beverage, enzyme and water samples.

	pH (RSD%)				Conductivity (RSD%)			
	Value (pH)	Within run	Between run	Total	Value (mS/cm)	Within run	Between run	Total
Wine	3.3	0.02	0.15	0.16	2.53	0.2	1.8	1.8
Juice	3.4	0.03	0.20	0.20	3.06	0.1	1.2	1.2
Sparkling water	5.3	0.39	0.27	0.48	1.357	0.5	1.6	1.7
Drinking water	6.8	0.29	0.27	0.39	0.059	0.5	0.2	0.5
Natural water	7.8	0.78	0.09	0.79	0.194	0.4	0.7	0.8
Waste water	6.6	0.03	0.08	0.08	8.19	0.4	0.3	0.5

Wine and juice precision studies were performed on the Gallery Plus discrete analyzer in three batches of 10 replicates per sample with the total number of replicates being 30. Water precision studies were performed on the Gallery discrete analyzer in two batches of 10 replicates per sample with the total number of replicates being 20.

Most importantly, the ECM module delivers the easy validation and calibration needed for regulatory compliance through ready-to-use standards and buffers. The user simply places the calibration standard into the machine to enable automated calibration. Instrument performance is validated by running NIST traceable standards as sample. Once this reference is confirmed, process samples can be run with the confidence that results will be fully accurate, compliant and audit ready.

NIST traceable standards for ECM measurements

Parameter	Code	Product name	Kit size
pH	984330	ECM pH 2 Standard	2 x 60 mL
	984331	ECM pH 4 Standard	2 x 60 mL
	984332	ECM pH 7 Standard	2 x 60 mL
	984333	ECM pH 10 Standard	2 x 60 mL
	984334	ECM pH 12 Standard	2 x 60 mL
Conductivity (mS/cm)	984339	ECM Conductivity 0.08 Standard	2 x 60 mL
	984336	ECM Conductivity 1.4 Standard	2 x 60 mL
	984337	ECM Conductivity 13 Standard	2 x 60 mL
	984338	ECM Conductivity 112 Standard	2 x 60 mL

By upgrading the Gallery or Gallery Plus discrete analyzer with the integrated ECM module, laboratories can have access to parallel and simultaneous measurement of electrochemical and photometric parameters. Through easy, fast and reliable pH and conductivity measurements, laboratories can deliver a world of insight to drive real change, make manufacturing processes more reliable, deliver high-quality products, protect vital and expensive equipment and ensure regulatory standards are met.

Find out more at thermofisher.com/discreteanalysis

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