TitraLab® *870* Titration Workstation

pH, Conductivity and Ion Measurements: Customised to *YOUR* exact application

Direct Measurements in Water

- **pH** measurements
- **Conductivity** measurements
- **Fluoride, Nitrate** by ISE

Potentiometric Titration in Water

- **Alkalinity and Hardness**
- **Chloride**
- **Chemical Oxygen Demand**

Multipurpose Potentiometric Titrator

- **Acid-base** titrations in aqueous/non-aqueous media
- **Redox** titrations, imposed or zero current
- **Complexometric and Precipitation** titrations
- **pH, Conductivity and ISE** direct measurements

- when you need to be sure...

TitraLab® 870

Combined Conductivity and Potentiometric Titration Workstation -

No more wasting time and bench space with multiple water analysis systems. Order your TitraLab system incorporating three high-performance instruments in one: an ion meter, a conductivity meter and a biburette Titration Manager. The TitraLab 870 comes as a complete package including appropriate electrodes, buffers and accessories adapted to your particular application. Getting started couldn't be simpler:

Save time and energy

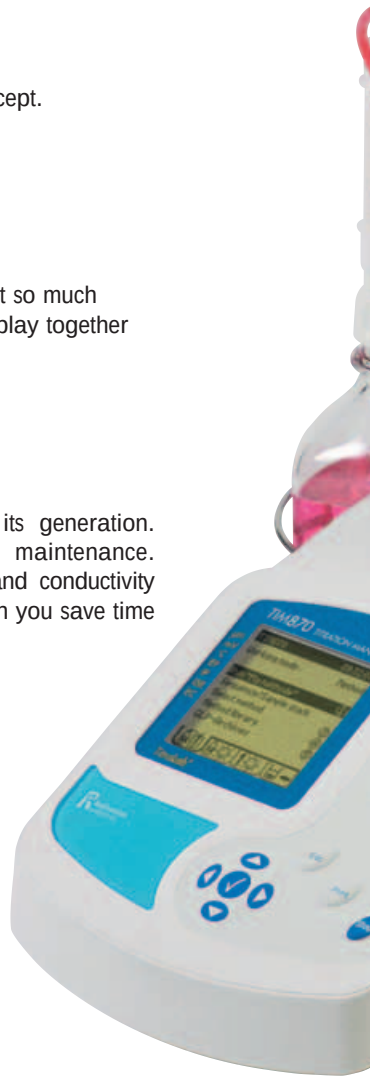
Intelligent design ensures effortless set-up and maintenance
All electrodes and tubing slot securely in place in one easy movement thanks to our unique bayonet concept. For convenient installation and maintenance, the mono-block titrating burette is mounted in no time.

Follow the display

Intuitive interface guides you at every step
The TIM870 Titration Manager prompts you with clear-text messages in a choice of languages, making it so much easier when you're doing routine work. The titration curve is easy to follow live on the large graphic display together with electrode and titrant status.

Press just one key

One-touch selections and pre-programmed functions make titrations easy to run
The TIM870 gives instant access to routine functions, making it by far the simplest titrator of its generation. Pre-set routines guide you when running analyses, repeating measurements and performing maintenance. The TIM870 allows you to automatically sequence and repeat measurements – ideal for direct pH and conductivity measurements followed by a titration in the same beaker. Predefined electrode and reagent libraries mean you save time and effort setting up your application.



Get it right first time

High-resolution burette, unique addition technique and special algorithms ensure accurate results
The TIM870's titrating burettes offer the highest resolution on the market giving unbeatable accuracy for your potentiometric titrations. Innovative electronic design supporting effective PID regulation loop algorithms combined with incremental or dynamic continuous titrant addition modes allow you to reach end points or to determine inflection points even more quickly. Whether you are working with sharp or weak curves or running single or multiple IP, detection is fast and reliable.

Stay in control

Efficient result recording meets strict traceability requirements
The TIM870 is the first titrator of its kind to offer full QC controls on your results. QC samples can be defined at specific intervals and, for greater security, QC requirements are directly defined at method level with password protection. Full traceability also means full result archiving thanks to a non-volatile memory which stores up to 200 results and 50 methods.

Plan ahead

Modular concept allows expansion to your future needs
On the TIM870, all interfaces are standard so you can add to your system as and when you wish. Increase your sample throughput from 10 to 126 samples using one of our sample changers. Add up to 4 additional burettes, 4 electrode inputs and 2 extra sample stands thanks to the versatile ABU52 dual burette system. Simplify data entry by connecting a standard PC keyboard and bar code reader. Obtain virtually unlimited storage capacity for your results with TitraMaster 85 PC Software.

Ready for immediate analysis

Ensuring the right choice for your application

At Radiometer Analytical, we put applications first. We offer you a dedicated package ready to use straightaway: electrodes, specific accessories, standards, maintenance solutions and, of course, methods and application notes. The only thing you have to supply is the sample!

With nearly 70 years' experience in electrochemistry, we know your business.
Visit us at www.ictsl.net to get the latest updates on customised solutions for your application.

TitraLab is a complete solution

All the elements are provided for a fully functional workstation

- A titration manager integrating all functions of a modern potentiometric titrator
- A high-performance conductivity and ion meter
- Two high-resolution burettes with a wide choice of volumes
- Two electrode inputs for standard pH or mV potentiometric titration, one for imposed current titration and a differential measurement mode
- A titration stand accommodating beakers from 5 to 400 ml and a choice of magnetic or propeller stirring
- Two bottle holders for keeping reagents securely in place
- A full set of accessories and cables for easily completing your workstation installation.

Technical Specifications

TitraLab® 870

Potentiometric methods

- End point titration: 1 to 4 pre-set end points.
- Inflection point titration: auto determination of 1 to 8 inflection points, programmable IP acceptation windows.
- Titrant addition techniques: incremental dynamic, incremental monotonic and continuous dynamic.
- Method reprocessing for curve and results: automatic or manual.
- pH electrode calibration: up to 5 points using IUPAC standards or 4-7-10 Series buffers with error recognition on buffer used.
- pH with temperature-compensated reading: probe, entered or fixed at 25°C.
- Direct pH/mV measurements with recording on stable reading.
- Back titration: manual or automatic.
- Reagent addition: up to 3 simultaneous or consecutive additions.
- Sequencing of up to 10 methods, including electrode and reagent calibrations.
- Coupling of 2 to 6 methods in one beaker, including direct ISE and EC measurements.

Conductivity method (EC)

- Direct conductivity measurements with recording on stable reading.
- Conductivity with temperature-corrected display: none, natural water (ISO 7888), linear.
- Conductivity cell cable resistance and capacitance compensation.
- Conductivity electrode calibration: manual cell constant entry or automatic determination using 1, 0.1 and 0.01 Demal KCl standards, NaCl 0.05% and standard sea water.

Ion-selective method (ISE)

- ISE measurements using standard additions or direct measurements with recording on stable reading.
- Additions or calibration with up to 9 points.
- Curves fitted using non-linear regression with Cø detection limit determination according to IUPAC.
- Automatic standard additions: volumes programmed or automatically determined.
- Curve plotting: GRAN plot vs. Volume for standard additions, mV = f(pC) for ISE calibration.

Measuring ranges

-9 to 23 pH
±2000 mV
4 µS, 40 µS, 400 µS
4 mS, 40 mS, 400 mS
-10°C to +100°C

Resolution

0.001pH
0.1 mV
1/4000 of scale
0.1°C

Printout

Automatic. GLP compliant. Continuous or page by page. Detailed or condensed. Laser, thermal or dot maxtrix printer.

Results

In each method, calculation of up to 8 results and 2 user-defined equations. QC check on results with visual warning. Statistical calculations. Recalculation on sample quantity before archiving.

Units

All standard units for samples/results. Conductivity: µS/cm or mS/cm. User-defined result units.

Storage capacity

Global password protection for programming access.
Non-volatile memory.
User programmable: 50 methods.
Libraries for 30 electrodes and 30 reagents: more than 30 electrodes and 20 titrants pre-identified with ID and type to help programming.
Storage of 200 results.
Embedded operating procedures for electrode and reagent exchange.
Automatic electrode, titrant calibration and QC prompt.

Sample list

Up to 126 data with alphanumeric ID.
QC sample definition.

Electrode stand - stirring

Magnetic stirrer (0 to 1100 rpm).
Propeller connection.
Beaker volume: 5 to 400 ml.

Burette

2 embedded burette stands.
Burette volumes available: 1, 5, 10, 25, 50 ml.
Burette motor: 18000 steps.
Complies with ISO 8655-3.
UV-protected encapsulated glass syringe.
Embedded operating procedures for burette exchange, air bubble removal (Flush).
Rinse, Fill, Empty function

Inputs/outputs

2 indicator and 1 reference electrode input.
Selectable polarised input: ±1 mA, DC or AC.
Differential input and temperature input.
2-/4-pole conductivity cell input.
0-5 V and 0-12 V TTL output.
0-5 V TTL input.
Serial connections: printer/PC, sample changer, balance, TitraMaster 85 PC Software.
4 additional burette and electrode inputs with ABU52.
PS/2 port: keyboard and/or barcode reader.

General specifications

Languages: English, German, Danish, French, Italian, Spanish, Swedish.

Casing
Fully splashproof chemical resistant lathene.
Graphic 128x128 dot LCD protected from spillages with TPX cover.
Rubber soft touch alphanumeric keypad.

Dimensions (H x W x D) and Weight:
380 x 230 x 450 mm (excl. tubing).
5 kg (excluding reagent bottles).

International standards (TIM870)
CE marking: complies with EMC directive 89/336/EEC and LV directive 73/23/EEC.
cETLus certification issued by ITS/SEMKO.
UL standard 61010A-1.
CSA standard C22 2 No. 1010.1-92.

Power requirements
47.5 – 63 Hz, 115/230 Vac +15 -18%.

Environmental operating conditions
5 to 40°C temperature.
20 to 80% relative humidity.

Ordering information

TitraLab systems

The TitraLab 870/xx-xx Combined Conductivity and Potentiometric Titration Workstation consists of the TIM870 pH/EP/IP/EC/ISE Titrator, biburette with a full set of connecting cables, cell accessories and two xx ml burettes.

Metrology

To comply with ISO 9001/ISO 17025 our Metrology Dept. can supply calibration and verification certificates. Our Cofrac accredited laboratory produces pH and conductivity standards with traceability and conformity certificates.

Examples of Application Packages
Technique-based
Acid/base titration in aqueous or non-aqueous media
Complexometric titrations
Argentimetric titration (halides and silver)
Redox titration (zero and imposed current)
Dedicated
Water analysis for pH and alkalinity
Water hardness according to ISO 6059
Chloride titration according to ISO 9297
Chloride titration according water std. meth. 20th ed. 4.51.4500D