Technical Specifications

- End-point titration, 1 to 2 preset end points.
- Reflective point titration.
- Auto determination of 1 to 4 injection points, programmable IP acceptance windows.
- IP detection using 10 & 20 derivative curves.
- Titration stops on pH, mV, ml, IP number.
- Titrant addition techniques: incremental dynamic, incremental monotonic and continuous dynamic.
- Titrant calibration.
- pH electrode calibration: up to 5 points using IUPAC standards or 5-10 Series buffers with error recognition.
- Direct pH/mV measurements: with recording on stable reading.
- Back titration with manual (TIM840) or automatic (TIM845) reagent addition.
- Sequencing of up to 3 discrete methods within a sample changer series.
- Coupling of 2 methods in one beaker.

Measuring ranges & Resolution
- pH: ±0.02 pH
- mV: ±0.1 mV
- °C: ±0.1°C

Printout
- Automatic GSP compliant.
- Selectable: no, 80 columns.
- Levels of detail defined by method.
- Printed data can be sent as a single character string for LIMS connection.

Results
- In each method, calculation of up to 4 results and 1 user-defined equation.
- Selectable: no, 80 columns.
- Differential calculation in case of sample quantity modification before archiving.

Units
- A standard units for samples/results.
- User-defined result units.

Storage capacity
- Global password protection for programming access.
- Non-volatile memory.
- User-programmable: 3 methods.
- Libraries for 15 electrodes and 15 reagents: more than 50 electrodes and 25 reagents pre-identified (ID and type) to help programming.
- Storage of up to 60 results, last electrode and last reagent calibration for each library.
- Stored parameters characterised by own ID, location and calibration data.
- Embedded operating procedures for reagent exchange and burette operation.

Sample list
- Up to 20 data with alphanumeric ID.

Electrode stand, stirrer
- Magnetic stirrer: 22 reproducible speeds (0 to 1100 rpm) in 50 rpm steps.
- Propeller connection.
- Beaker volume: 5 to 400 ml.

Burette
- 1 or 2 embedded burette stands.
- Burette volumes available: 1, 5, 10, 25, 50 ml.
- Delivered with 25 ml burette.
- Burette motor: 18000 steps.
- Complies with ISO 8085-3.
- UV-protected encapsulated glass syringe.
- Autotitration with manual addition.
- Automatic addition (TIM845) reagent addition.
- Automatic air bubble removal (Flush).
- Fully splashproof latene®.

Application Packages Available

Technique-based
- Acid-base titration in aqueous or non-aqueous media
- Complexometric Titrations
- Potentiometric titrations: pH, Alkalinity
- Redox titrations: zero and imposed current

Dedicated
- Water hardness, calcium and magnesium determinations
- Alkalinity and acidity determinations
- Oxygen titration (oxygen and impaired current)

Consult our on-line application catalogue at www.titration.com

General specifications

- Environmental conditions:
  - 5 to 40°C ambient temperature.
  - 20 to 80% relative humidity.
  - 5 to 40% relative humidity.
  - 20 to 80% relative humidity.

- Technical specifications:
  - ±2000 mV 0.1 mV
  - -9 to 23 pH 0.001 pH
  - -10°C to +100°C 0.1°C

- Measuring ranges
  - -9 to 23 pH 0.001 pH
  - ±0000 mV 0.1 mV
  - -10°C to +100°C 0.1°C

- Resolution
  - ±0.02 pH
  - ±0.1 mV
  - ±0.1°C

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- Sample list
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- Measurement ranges
  - -9 to 23 pH 0.001 pH
  - ±0000 mV 0.1 mV
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TitraLab® 840 and 845
Routine Potentiometric Titration Workstations -

No more wasting time setting up. Order your TitraLab system incorporating the high-performance single burette TIM840 or biburette TIM845 Titration Manager with the appropriate application package and it will arrive with all you need. Getting started couldn’t be simpler:

**Save time and energy**
Intelligent design ensures effortless application setup and maintenance.
The TIM840 and 845 are delivered with preprogrammed methods so you can get your analyses started in no time. Electrodes and reagent addition tubing slot securely in place in a single movement thanks to our unique bayonet concept.

**Follow the display**
Intuitive interface guides you at every step.
The TIM840 and TIM845 prompt 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. Your titrator beeps each time an action is required or the final result is obtained allowing the operator to multi-task.

**Press just one key**
One-touch selections and preprogrammed functions make titrations easy to run.
The TIM840 and TIM845 give instant access to all main routine functions, making them by far the simplest titrators of their generation. Preset routines guide the operator through each step of the analysis providing assistance with alphanumeric sample ID and sample quantity entry and repeat measurements. Shortcuts allow you to run an analysis from start to finish by pressing a single key.

**Get it right first time**
High-resolution burette and unique addition technique ensure accurate results.
The TIM840 and TIM845’s titrating burettes offer unbeatable accuracy for your potentiometric titrations. Incremental or dynamic continuous titrant addition modes allow you to reach end points or to determine inflection points quickly whether you are working with sharp or weak curves or running single or multiple IP.

**Stay in control**
Assistant function and extensive data storage give complete confidence in your results.
You can ensure your analysis stays on track thanks to an embedded assistant mode which guides you through operations such as calibration or reagent installation as well as graphic icons that indicate calibration status. An extensive non-volatile memory saves your current application methods and lets you check the last results obtained. When you select a method from the library, the required electrode and reagents are displayed so there is no risk of error.

**Plan ahead**
Modular concept allows expansion to your future needs.
On the TIM840 and TIM845, all interfaces are standard so you can add to your system as and when you wish. Increase your sample throughput by using our SAC80 Sample Changer. Simplify data entry by connecting a standard PS2 computer keyboard and/or a barcode reader. Obtain virtually unlimited storage capacity for your results with TitraMaster 85 Data Collector Software.
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On the TIM840 and TIM 845, all interfaces are standard so you can add to your system as and when you wish. Increase your sample throughput by using our SAC80 Sample Changer. Simplify data entry by connecting a standard PS2 computer keyboard and/or a bar code reader. Obtain virtually unlimited storage capacity for your results with TitraMaster 85 Data Collector Software.

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 more than 70 years’ experience in electrochemistry, we know your business. Visit us at www.titration.com 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
- One or two high-resolution burettes with a wide choice of volumes
- One electrode input for standard pH or mV potentiometric titration, one for imposed current titration
- A titration stand with a magnetic stirrer accommodating beakers from 5 to 400 ml and offering optional propeller stirring
- A full set of accessories and cables for easily completing your workstation installation.
Technical Specifications

Methods
- End-point titration, 1 to 2 preset end points
- Inflection point titration
- Auto determination of 1 to 4 inflection points
- Programmable IP acceptance windows
- IP detection using 16 & 2nd derivative curves
- Titration stops at pH, mV, ml, IP number
- Titrant addition techniques: incremental dynamic, incremental monotonic and continuous dynamic
- Titrant calibration
- pH electrode calibration: up to 5 points using buffer solutions
- Direct pH/mV measurement
- Back titration with manual (TIM840) or automatic (TIM845) reagent addition
- Sequencing of up to 3 consecutive methods within a sample changer series
- Coupling of 2 methods in one beaker

Measuring ranges
- Resolution: ±0.001 pH, ±0.01 mV, ±0.1°C

Printout
- Automatic, User defined
- 3 levels of detail defined by method
- Printed data can be sent as a single character string for LIMS connection

Results
- In each method, calculation of up to 4 results and 1 user defined equation
- Statistical calculations: Ornstein-Uhlenbeck result calculation in case of sample quantity modification before archiving

Units
- All standard units for samples/results
- User defined result units

Storage capacity
- Global password protection for programming access
- Non-volatile memory
- User programmable: 3 methods
- Libraries for 15 electrodes and 15 reagents: more than 30 electrodes and 20 titrants pre-identified (ID and type) to help programming
- Storage of at least 60 results, last electrode and last reagent calibration for each library
- Stored parameters characterised by own ID, location and calibration data
- Embedded operating procedures for reagent exchange and burette operations

Sample list
- Up to 20 data with alphanumeric ID

Electrode stand - stirring
- Magnetic stirrer: 22 reproducible speeds (0 to 1100 rpm) in 50 rpm steps
- Propeller connection
- Beaker volume: 5 to 400 ml

Burette
- 1 or 2 embedded burette stands
- Burette volumes available: 1, 5, 10, 25, 50 ml
- Delivered with 25 ml burette
- Burette motion: 18000 steps
- Complies with ISO 8655-3
- UV-protected encapsulated glass syringes
- Embedded operating procedures for burette exchange, air bubble removal (Flush)

Inputs/outputs
- 2 indicator and 2 reference electrode input
-Selectable polarised input from -1 mk to 1 mk in ±1 µk steps: DC or AC
- Differential input for a third platinum electrode
- Temperature input: 0-5 V TTL output
- Serial connections: printer, balance, addition, interface
- PS/2 port: PC keyboard, barcode reader

Languages
- English, German, Danish, French, Italian, Spanish and Swedish

General specifications
- Casing: Fully splashproof latex®
- Graphic 128x128 dot LCD protected from spillages with TPX® cover
- Embedded operating procedures for burette stand - stirring
- UV-protected encapsulated glass syringes
- Complies with ISO 8655-3
- Delivered with 25 ml burette
- Also available with burette (TIM840,NB and one or two 25 ml burettes). Also available without burette (TIM840,NB and one or two 25 ml burettes). Also available with full set of connecting cables, cell accessories and one or two 25 ml burettes.
- Tempered glass beaker with measuring mark
- PC port: PC keyboard, barcode reader

Error specification
- ±1 mV, ±0.1°C

Power requirements:
- 475 - 63 Hz, 115/230 Vac ±15 -18%
- 20 to 80% relative humidity

Environmental conditions:
- 5 to 40°C ambient temperature
- 20 to 80% relative humidity
- 47.5 – 63 Hz, 115/230 Vac ±15 -18%
- 20 to 80% relative humidity

Ordering information
- TitraLab systems
- The TitraLab 840/25 or TitraLab 845/25 Potentiometric Titration Workstations consist of TIM 840 pH/EP/IP Titrator, monoburette or TIM 845 pH/EP/IP Titrator, diburette with full set of connecting cables, cell accessories and one or two 25 ml burettes. Also available with burette (TIM840,NB and one or two 25 ml burettes). Also available without burette (TIM840,NB and one or two 25 ml burettes). Also available with full set of connecting cables, cell accessories and one or two 25 ml burettes.
- Complies with ISO 9001 and EN 10205 requirements. Our Metrology Dept. can supply calibration and verification certificates. Our Co forCred accredited laboratory produces pH and conductivity standards with certificates of traceability and conformity.

Food & Beverage
- Substances of interest include: Total acidity, Total Hardness, Chloride, Chemical Oxygen Demand
- Application Packages Available
- Food & Beverage
  - Total acidity: wine, vinegar, fruit juices, milk
  - Chloride: milk, butter, other dairy products
  - Ascorbic acids: fruit juice and food
  - Free & Total SO2: wine and fruit juice

Environment & Water
- Substances of interest include: pH & Alkalinity, Total Hardness, Chloride, Chemical Oxygen Demand
- Application Packages Available
- Environment & Water
  - pH & Alkalinity
  - Total Hardness
  - Chloride
  - Chemical Oxygen Demand

Chemical & Plating
- Substances of interest include: Acid-base determinations in aqueous/non-aqueous media
- Imposed & zero current redox determinations
- Complexometric determinations
- Silver & precipitation determinations

Petrochemical
- Substances of interest include: Acid-base determinations in aqueous/non-aqueous media
- Imposed & zero current redox determinations
- Complexometric determinations
- Silver & precipitation determinations

Application Packages Available
- Food & Beverage
- Environment & Water
- Chemical & Plating
- Petrochemical

Consult our on-line application catalogue at www.titration.com