TitraLab® Titration Workstations

Environment/Water - Food/Beverage - Petrochemistry - Chemical/Plating
Pharmaceutical/Cosmetics/Biotechnology

Titration customised to *YOUR* exact application

Radiometer analytical
A Hach Company Brand

- when you need to be sure...

The TitraLab® Concept

Why do we use titration?

It can be essential to know the exact concentration of a chemical species or molecule in raw materials or products in order to ensure the efficiency of a manufacturing process and the quality of the finished goods. Among the many techniques available, titration is commonly selected because of its ease of implementation, cost-effectiveness and accuracy. As it is well suited to a wide range of applications and concentrations, it has been adopted as a standard technique in a variety of industries such as water quality, pharmaceuticals, petrochemicals and food and beverage.

Whatever the application, productivity and traceability are of paramount importance. Automation of routine titration increases analysis throughput and secures the consistent quality of results and integrated documentation functions ensure compliance with Good Laboratory Practice.

Radiometer Analytical's TitraLab range is designed to satisfy this demand with systems ranging from simple routine titrators for basic applications to high-performance customised set-ups with sample changers and dedicated software.

Contents

This catalogue gives an overview of how TitraLab can meet your titration requirements.
Detailed individual brochures are available for each instrument.
To see what TitraLab provides for your particular application, visit us at

www.titration.com

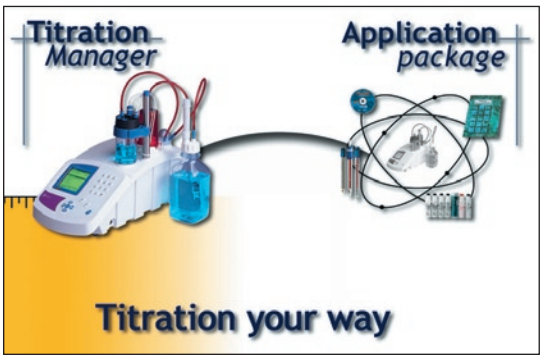
What is TitraLab?

TitraLab is a complete solution providing all the elements required to build workstations customised to individual applications: Titration Managers, sample changers, software, electrodes, solutions and accessories.

Accuracy, traceability, reliability and ease of use are all key features of our instruments. Clear-text menus simplify programming and large displays with real-time curve plotting allow you to check everything is running smoothly at a glance. Alphanumeric entries and detailed printouts make it easy to follow Good Laboratory Practice.

The TitraLab concept goes beyond the instruments themselves. We have put our 70 years' experience in electrochemistry to good use. TitraLab includes dedicated packages for your application ready to use straightaway: instrument, electrodes, specific accessories, pH calibration and maintenance solutions and, of course, methods and application notes. The only thing you have to supply is the sample!

At Radiometer Analytical, we put applications first.

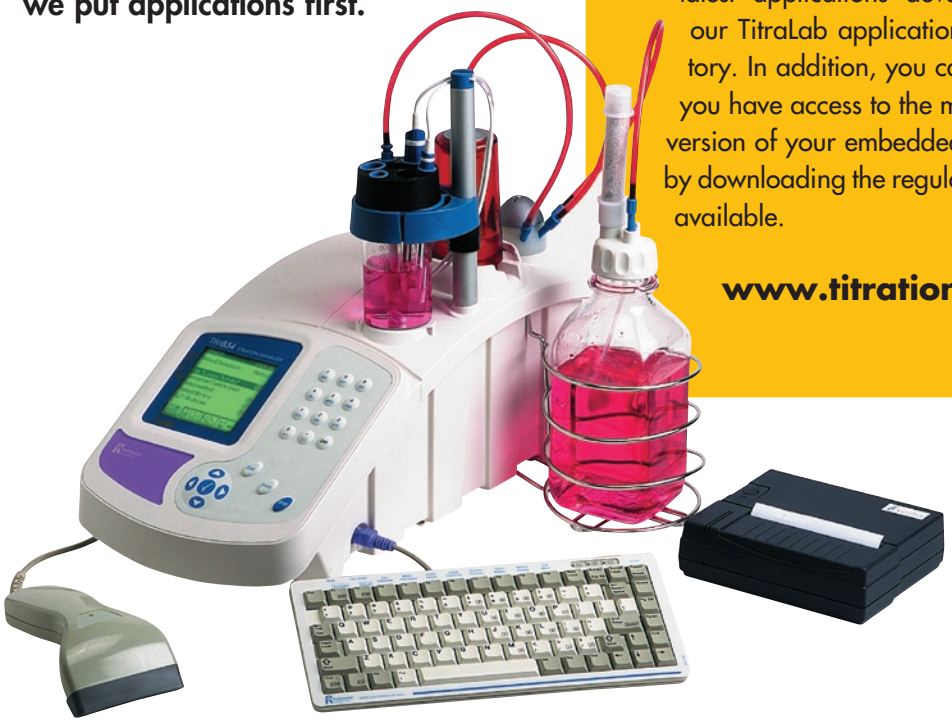


TitraLab Resource Centre

TitraLab customers enjoy all-round support from our world-wide network of distributors. This includes advice on the right product for your application, assistance in installation and training and comprehensive metrology services.

As a TitraLab user, you can take advantage of our on-line Resource Centre. You will find useful literature on theoretical and practical topics and the latest applications developed by our TitraLab applications laboratory. In addition, you can be sure you have access to the most recent version of your embedded software by downloading the regular updates available.

www.titration.com



A Workstation for Every Application

- Dedicated packages

- pH + acidity + free and total SO_2 in wine
- pH + acidity + chloride in condiments
- pH + acidity + formol index in fruit juice and soda
- pH and alkalinity in water
- Acid/base determinations in plating baths
- Redox determinations in plating baths
- Peroxide number in edible fats and oils
- Chloride in milk, butter and other dairy products
- Ascorbic acid determination in food and beverages
- Water hardness, calcium and magnesium determination
- TAN and TBN, bromine number and bromine index according to ASTM
- Mercaptans according to ASTM
- Moisture in cosmetics, chemical, food, pharmaceutical and petroleum products

- Technique-based packages

- Conventional acid/base titration for equivalence point of pH <9
- High-alkalinity acid/base titration for equivalence point of pH >9
- Argentimetric titration (halides and silver)
- Redox titration (zero and imposed current)
- Acid/base titration in non-aqueous media
- Complexometric titration
- pH-Stat titration for standard volumes from 8 to 100 ml
- pH-Stat titration for micro volumes from 0.5 to 9 ml
- Volumetric Karl Fischer titration

- Choose the right workstation for your application

Branch of Activity	Typical Applications	Ideal TitraLab workstation
Environment/Water	pH/mV, Alkalinity	840
	+ Hardness, Calcium/Magnesium, Chloride	865
	+ Conductivity, Fluoride	870
Food/Beverage	pH/mV, Chloride, Aqueous acid/base titration, Free & total SO_2, Formol index	840/845
	Moisture determination	580/585
Pharmaceutical/ Cosmetics/ Biotechnology	pH/mV, Complexometric titrations, Redox titration, Aqueous and non-aqueous acid/base titration	960/965/980
	pH/mV-Stat	854/856
	Moisture determination	580/585/980
Petrochemical	mV, TAN, TBN, Sulphur and Mercaptans, Bromine/iodine index	840/845/960/965/980
	Moisture determination	580/585/980
Chemical/Plating	pH/mV, Acid/base titration, Redox	840/845/960/965
	Moisture determination	580/585

- Choose the right workstation for your technique

Workstations: TitraLab	580	585	840	845	854	856	865	870	960	965	980
Monoburette	√		√		√				√		
Biburette		√		√		√	√	√		√	√
Detachable stand									√	√	√
pH/mV End Point determinations			√	√	√	√	√	√	√	√	√
pH/mV Inflection Point determinations			√	√			√	√	√	√	√
pH/mV Stat titration					√	√					
Volumetric Karl Fischer	√	√									√
Conductivity measurements								√			
ISE measurements								√			

Potentiometric Titration Workstations

- Ready for immediate analysis!

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

Communicate intelligently

Wireless burette stand communication simplifies GLP compliance
The lastest additions to the TitraLab range communicate with their detachable burette stands via wireless RFID technology. Stand changeover is fast and reliable thanks to instant data recognition which ensures you use the right reagent with the right data every time.

Save time and energy

Intelligent design ensures effortless setup and maintenance
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 simple instructions

Intuitive interface guides you at every step
The Titration Managers prompt you with clear-text messages in a choice of languages, making it so much easier when you're doing routine work.

See key data at a glance

A large graphic display gives an instant view of results and analysis status
The titration curve is easy to follow live on the large graphic display together with important data such as the flow rate, time and dispensed volume. All parameters are displayed in clear text and results can be seen at a glance. Electrode and titrant status are visualised using easily recognisable icons.

Get measurements right first time

Versatile programming and a high-resolution burette ensure speed and accuracy
Radiometer Analytical's Titration Managers provide you with flexibility to adapt your methods to your needs. Automatic sequencing and repetition of measurements are ideal for programming a direct measurement followed by a titration on the same sample or including a calibration in a series of analyses. For greater control, QC intervals can be defined. The titrating burettes offer the highest resolution on the market giving unbeatable accuracy for your potentiometric titrations.

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.

Think of tomorrow

Customisable design meets your future needs
All interfaces are standard so you can adapt your system as and when you wish with a sample changer, standard PC keyboard and/or bar code reader or a PC with TitraMaster 85 Software. You can add up to 4 burette motors and 4 electrode inputs by connecting two ABUxx Biburettes.

pH
mV
°C
EP
IP

TitraLab 840/845

Routine Titration Workstations

pH
mV
°C
EP
Stat

TitraLab 854/856

Stat Titration Workstations

pH
mV
°C
EP
IP

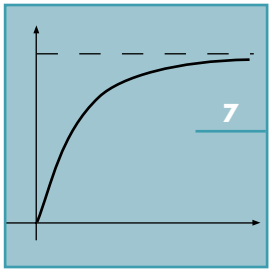
TitraLab 865

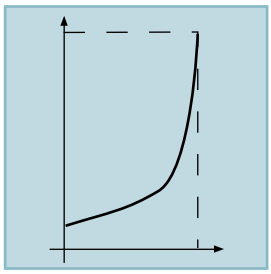
Potentiometric Titration Workstation

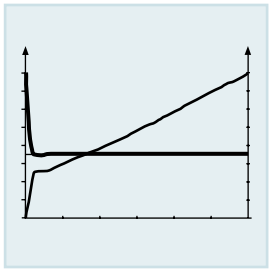
pH
mV
°C
EP
IP
EC
ISE

TitraLab 870

Combined Conductivity and Potentiometric Titration Workstation







pH
mV
°C
EP
IP

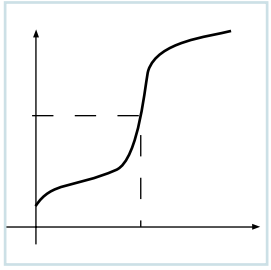
TitraLab 960/965

Potentiometric Titration Workstations (detachable stands)

pH
mV
°C
EP
IP
KF

TitraLab 980

Volumetric KF and Potentiometric Titration Workstation (detachable stands)

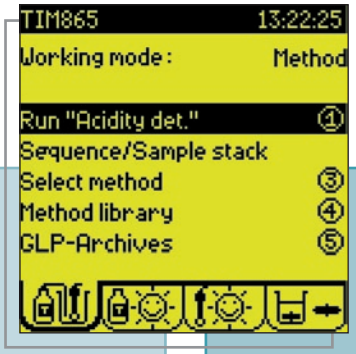


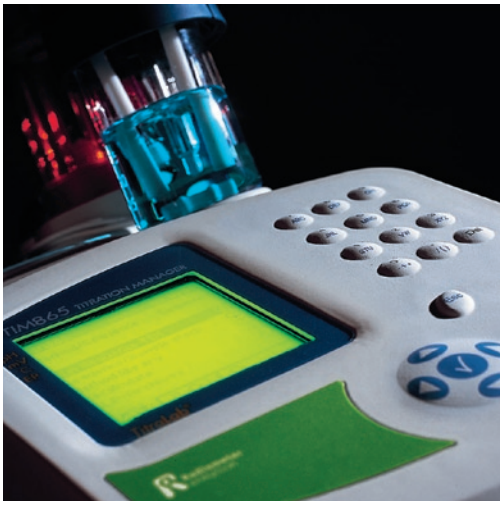
Potentiometric Titration Workstations

- A new user interface...

The Titration Manager interface has been designed to prompt you through every step of programming and running an analysis. You will find that operating your titration unit has never been simpler:

- Alphanumeric keypad allows entry of data and parameters.
- Large graphic display gives detailed overview of each function.
- Animated icons show information on titration status.
- Keypad numbers provide shortcuts to functions.
- Active on-line help guides operator in setting up the system.

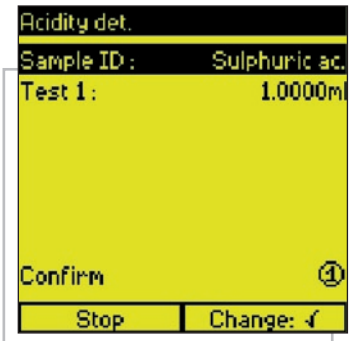




…to guide you every step of the way

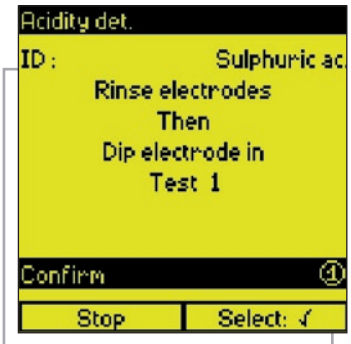
1

Select your method.



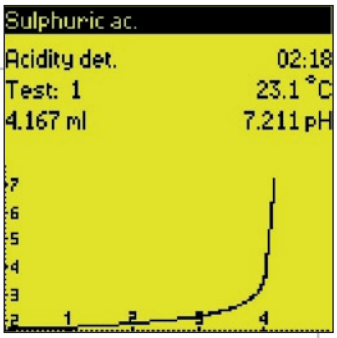
2

Enter sample ID and quantity.



3

Prepare your sample.

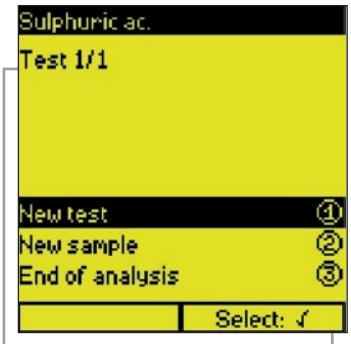


4

Keep an eye on the titration in progress.

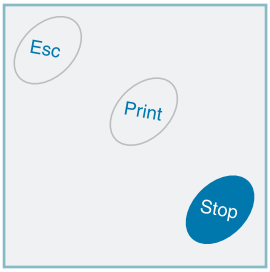
5

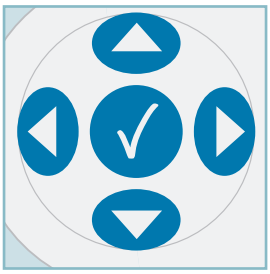
Archive your result.



6

End or repeat your analysis.





Potentiometric Titration Workstations

- Technical specifications

TitraLab	840	845	854	856	865	870	960	965	980
Techniques									
pH/mV measurements	✓	✓	✓	✓	✓	✓	✓	✓	✓
End Point titration	✓	✓	✓	✓	✓	✓	✓	✓	
Inflection Point titration	✓	✓			✓	✓	✓	✓	✓
pH-Stat titration			✓	✓					
Volumetric Karl Fischer									✓
Conductivity measurements						✓			
ISE measurements						✓			
Titrant addition techniques									
Continuous dynamic		✓		✓		✓		✓	✓
Incremental monotonic & dynamic		✓		✓		✓		✓	✓
Burette									
Detachable burettes							✓	✓	✓
Number of titrating burettes	1	2	1	2	2	2	1	2	2
Burette volumes (ml)	1 , 5 , 10 , 25 , 50								
Additional titrating burettes			Up to 4 with 2 x ABU52				Up to 4 with 2 x ABU62		
Extension/Module									
Sample changer		✓		✓		✓		✓	✓
Balance		✓		✓		✓		✓	✓
Printer		✓		✓		✓		✓	✓
PC software		✓		✓		✓		✓	✓
Peristaltic pump/TTL connections		✓		✓		✓		✓	✓
PC keyboard and bar code reader		✓		✓		✓		✓	✓
Built-in pump for solvent handling									✓
Electrode inputs									
Indicator electrode	1					2			
Reference electrode	1								
Polarised electrode	1								
Selectable polarised input	±1 mA in 1 µA steps, DC or AC								
Additional electrode inputs			Up to 4 indicator, 2 polarised and 2 reference with 2 ABU52 /2 ABU62						
Differential measurement		✓		✓		✓		✓	✓
Types of titration									
Direct titration		✓		✓		✓		✓	✓
Back titration		✓		✓		✓		✓	✓
Blank determination		✓		✓		✓		✓	✓
Titrant standardisation		✓		✓		✓		✓	✓
pH electrode calibration	Up to 5 points								
Method sequencing	Up to 3 methods		Up to 10 methods in a series						
Method coupling per sample	2		8		4	6	8		8

TitraLab	840	845	854	856	865	870	960	965	980
Sample list									
Number of samples	Up to 20 samples		Series up to 126 samples with alphanumeric ID						
QC sample definition			✓		✓	✓	✓		✓
Measuring ranges/Resolution									
pH	-9 to 23 pH/0.001 pH								
mV	±2000 mV/0.1 mV								
°C	-10°C to +100°C/0.1°C								
Water content									0.1% to 100%
Conductivity						4 µS to 400 mS/cm			
Results									
Auto calculation	On selected result units								
User-defined equations	1		2 with user-defined result units						
QC check with visual warning			✓		✓	✓	✓		✓
Statistical calculations	✓		✓		✓	✓	✓		✓
Automatic GLP printout	3 levels of detail								
Storage capacity									
Pre-programmed methods	✓		✓		✓	✓	✓		✓
Global password protection	✓		✓		✓	✓	✓		✓
Non-volatile memory	✓		✓		✓	✓	✓		✓
User-programmable methods	10		50 including pre-programmed methods						
Electrode library	15		30 including pre-programmed electrodes						
Reagent library	15		30 including pre-programmed reagents						
Pre-identified electrodes	A catalogue of up to 30 electrode names and characteristics								
Pre-identified titrants	A catalogue of up to 20 reagent names								
Results storage	60		Up to 200 sample results, 100 electrode + 100 reagent calibrations						
Electrode stand/Stirring									
Magnetic stirrer	✓		✓		✓	✓	✓		✓
Propeller stirrer connection	✓		✓		✓	✓	✓		✓
Beaker volume	5 to 400 ml								
General specifications									
Casing	Splashproof lathene								
Keypad	Alphanumeric silicone								
Display	Graphic 128x128 dot LCD								
Languages	English, French, German, Danish, Spanish, Italian, Swedish								
Dimensions (H x W x D)	380 x 230 x 450 mm								
Weight (excl. reagent bottles)	5 kg								
Power requirements	47.5-63 Hz; 115/230 Vac +15 -18%								

Karl Fischer Titration Workstation

- Routine moisture determination…

The determination of water content is essential in many industries in order to optimise processes and product shelf life. The TitraLab 580 monoburette and TitraLab 585 biburette Karl Fischer Titration Workstations provide all you need for fast and reliable moisture determination in both solids or liquids, whatever your application.

Enjoy full confidence in your results

The titrating burettes on the TitraLab 580/585 offer unbeatable accuracy for your Karl Fischer titrations. Innovative use of PID regulation loop algorithms and dynamic continuous titration addition allow you to end titrations extremely quickly with no risk of overshooting.

Save bench space

The burette, pump, titration stand and keyboard are all integrated in one compact unit about the size of your laboratory notebook.

Ensure safety and convenience

An electronically driven pump handles KF reagents. During operation, direct contact with solvents is totally avoided as the system controls cell filling and waste removal. An embedded assistant function guides the operator through calibration or reagent installation and instantly recognisable graphic icons indicate status.

Rely on maximum tightness

The Karl Fischer cell is easy to set up with electrodes and tubing slotting quickly and securely in place. It is specially designed to keep all atmospheric moisture out and simplify sample injection.

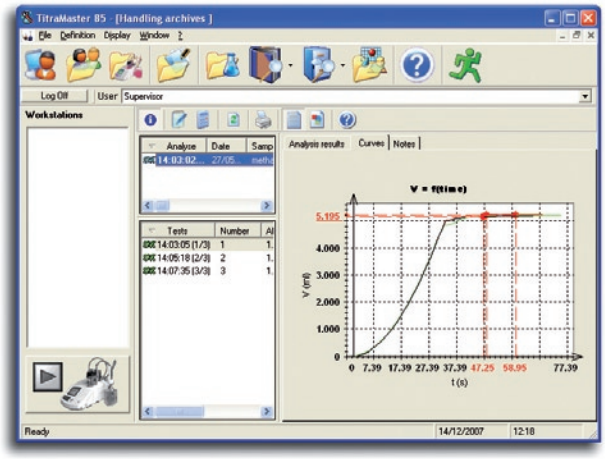
Increase analysis throughput

Preset routines guide the operator, facilitating entry of sample quantity and alphanumeric ID. Automatic detection of sample injection together with automatic drift determination and compensation with shortcuts result in speed and efficiency. Moreover, automatic cell conditioning reduces downtime while continuous and intelligent cell volume monitoring prevents overflowing.

Exploit your results to the full

TitraMaster 85 PC Software allows you to program and run methods on the TIM580 and 585 directly from your PC. Its multitasking function makes it easy to follow analyses,check results and compile reports while analyses are in progress.

...better than ever before



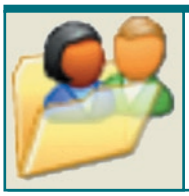
Specifications			
Titration methods	Volumetric KF titration	**Karl Fischer cell**	Minimum volume: 35 ml ±5 ml
	KF reagent standardisation		Maximum volume: 150 ml ±5 ml
	Blank determination		Screw type glass beaker, clear or brown, standard or thermostated
Storage capacity/GLP	50 methods including 6 preprogrammed applications with alphanumeric ID and protection		Easy-dismount pump module
		Pneumatic circuit	Solvent addition and cell emptying
	200 results	**Inputs/Outputs**	One electrode input & connections for Printer/PC and additional titrator
	10 blank determinations		
Burette	Encapsulated glass syringe		Balance
	UV protection		PC keyboard and/or bar code reader
	Titrant exchange procedures		Sample changer
Dimensions (H x W x D)	380 x 230 x 450 mm (excluding tubing)	**Printouts**	Condensed and detailed GLP bulletins
Weight	5 kg (excluding bottles)	**Languages**	English, French, German, Spanish, Italian, Danish and Swedish
Power requirements	47.5 - 63 Hz, 115/230 Vac +15 -18%		

Dedicated PC Software

- TitraMaster 85, a user-friendly tool...

Handling sample throughput efficiently while keeping data securely stored for future access is an essential requirement for all laboratories. With TitraMaster 85 user-friendly titration software, you can program applications directly from the computer while processing data from as many as 7 titration workstations or high-performance ion analysers.

Secure your system completely



User logins and operator passwords prevent unauthorised access
In TitraMaster 85 an access level is assigned to each operator together with a strictly personal login and password. Each hierarchical level gives access to specific rights and functions to protect against unauthorised use and unintentional changes.

Program your applications conveniently

Computer environment facilitates creation of applications
Applications can be programmed and managed directly from the TitraMaster 85 database application window on your PC. Each application is fully traceable with a version number and a complete historical record of changes. You can reuse an existing application or return to a previous version.

Run your applications instantly

Straightforward interface allows applications to be set up in no time
Select an application from your database, fill in the sample stack, press RUN and follow instructions. That's all there is to it. Automatic prompts guide you step by step making your analysis simpler and safer.

Check your results at any time

Immediate information on titration curves and results
Curves and records are displayed live with clear result status icons. Data from each workstation connected can be featured in an individual window to give you an overview of analyses in progress. While analyses are running, the database can be searched by user-selectable criteria so you can process the results that matter.

Record all your data securely

Automatic archiving guarantees you never lose data
TitraMaster 85 offers a powerful automatic archiving tool which allows you to retrieve records fast and efficiently via user-programmed requests. Each record is stored with a full set of information specifying how, where, when and by whom it was obtained.

...for secure and efficient data management

Follow your result trends graphically

Visual control chart tool makes Quality Control easy
For all analysis results defined with acceptation limits - electrode or reagent calibration, QC sample or sample batch analysis - you can plot a control chart to keep track of progress. This ensures you obtain a clear view of trends in measuring chain performance and analytical data.

Exploit your results to the full

Data processing and export functions ensure you make efficient use of your data
Your results can be recalculated and/or curves reprocessed according to your requirements with no risk of losing raw data. Data can be exported to LIMS or Microsoft Office applications in various file formats.

Extended FDA 21 CFR Part 11 solution

Radiometer Analytical has developed a special version of TitraMaster 85 Software in order to help your laboratory fulfil its obligations regarding document submission and legally binding electronic signatures in compliance with Food and Drug Administration 21 CFR Part 11 requirements.

With the **TitraMaster 85 FDA21CFR11 version**, you can be sure of:

- Electronic signatures
- System validation
- Unfalsifiable records
- Standard-format exporting
- Password protection
- Controlled access
- User accounts
- Audit trail
- Data tracking
- GLP compliance
- Secure backup
- Application traceability

The audit report of an outside organisation which examined TitraMaster 85 compliance with FDA 21 CFR Part 11 is available on request.

SAC850 and SAC950 Sample Changers

- Effortless sample handling...

The obvious choice for your laboratory

Radiometer Analytical sample changers are capable of handling multiple combinations of titrations, direct pH, ion and conductivity measurements fast and efficiently. Connect to a TitraLab titration workstation or a direct measurement meter with or without PC software selected from our complete laboratory product range and your laboratory will virtually run itself!

Compact and Adaptable

The SAC850 and SAC950 are compatible with a wide selection of removable sample trays, making them remarkably space-efficient. No special beakers are required; they accept standard glass and disposable beakers with volumes ranging from 25 to 400 ml.

There is no need to programme the sample changer each time a new type of sample tray is used as it is instantly identified by a wireless RFID tag containing all relevant geometrical characteristics. High rotation speed and smooth turntable movements allow fast and safe navigation between samples.

Flexible and Programmable

Sample preparation sequences can be programmed from TitraMaster 85 Titration PC Software with specific macro commands to fit your requirements. User-defined sample preparation sequences offer all the benefits of full automation. You can activate the Start/Stop stirring function or the pumps for a chosen duration, wait or send a TTL command to/from an external device and wait for a specified temperature to be reached.

Quick and Efficient

The powerful Dynamic Spray Rinse feature and high flow-rate pumps ensure quick and thorough cleaning with no risk of cross contamination between samples, helping you achieve greater accuracy and reproducibility, irrespective of the number of samples per cycle. Efficient rinsing is obtained thanks to repeated vertical movements of the head combined with the mechanical action of the sprays.

Rinsing liquid is sprayed from all directions over the entire height of the electrodes and tips while the waste pump empties beakers and evacuates rinse waste. This dynamic rinsing performed directly over the analysed beaker reduces the total duration of the sample changer cycle multiplying the number of samples analysed per day.

Safe and Clean

Our unique bayonet concept keeps electrodes and delivery tips securely in place. This ensures reproducible results and allows you to use any combination of electrodes, conductivity cells, temperature sensors or delivery tubes for your analyses. Tubes and cables can be inserted or removed in no time and are held in position in a cable carrier for maximum convenience. Reagent addition tubes are permanently visible for inspection.

The SAC950 includes 3 external beaker positions (2 for dip rinsing/conditioning and 1 for parking) allowing you to exploit the full beaker capacity of the tray and increase the number of samples analysed per cycle.

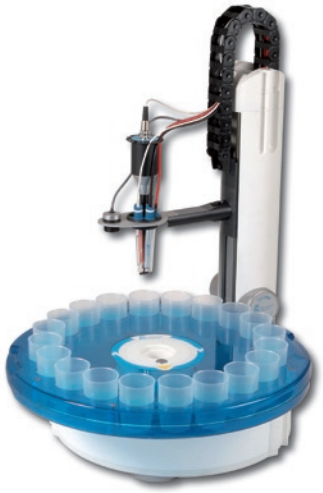
...through total automation

SAC950:
Extended model for automation of large sample series

- Multi-radius sample trays for up to 70 samples.
- External parking position.
- External dip rinsing and electrode conditioning on 1 or 2 positions.
  - Dynamic rinsing combined with waste disposal performed inside the current sample beaker, the external park beaker or one of the 2 external dip rinse beakers.
- Beaker cover module for sample protection prior to analysis (optional).

Functions	SAC950	SAC850
Propeller stirrer 0 - 1200 rpm	●	●
Magnetic stirring (single-radius only) 0 - 1000 rpm	●	●
Beaker detection	●	●
Embedded programmable sample preparation sequences	●	●
2 dip rinsing/conditioning + 1 parking positions, external	●	-
2 dip rinsing/conditioning + 1 parking positions, on sample tray	-	●
Unused electrode and tip storage, 4 positions	●	●
Integrated keyboard for manual sample changer control	●	●
Dynamic rinse/waste disposal pumps, 1 module	O	O
Reagent addition peristaltic pump, 1 module	O	O
Beaker cover module (sample protection prior to analysis)		O

● : Standard O : Optional - : Not available



SAC850:
Basic model for automation of small sample series

- Single-radius sample trays for up to 24 samples.
- Parking position on sample tray.
- Dip rinsing/electrode conditioning performed on 1 or 2 dedicated positions on sample tray.
  - Dynamic rinsing combined with waste disposal performed inside current sample beaker.

SAC950 Key Features

4 dedicated park positions save time as you can switch between the electrodes and addition tips required for your applications without having to remove and reinstall them each time.

The powerful propeller stirrer ensures perfect homogeneity of all kinds of sample and enhances result reproducibility.

The co
sures t
into pl

Sample changer status is visible from a distance thanks to a coloured LED: analysis cycle in progress (violet), ready for new analysis cycle (blue), operating error (red).

An embedded keypad ensures quick and easy manual control of movements and pump operation.

SAC950

onvenient cable carrier en-
ubes and cables slot easily
ace for faster setup.

An innovative ultrasonic transducer guarantees both beaker detection in under a second and safer operation by eliminating any risk of reagent spillages.

The beaker cover option avoids any risk of interaction between the samples and the environment prior to analysis.

Reagent addition via the built-in peristaltic pump minimises sample preparation time, simplifies the operator's task and increases sample throughput.

Automatic beaker emptying after analysis disposes of waste reagents and rinsing liquid making the tray lighter and easier to remove.

SAC850 and SAC950 Technical Specifications

Trays

Sample tray capacity SAC850 Single-radius	Sample tray capacity SAC950 Multi-radius	Glass beakers*		Polypropylene beakers	
		Capacity	Ø x H (mm)	Capacity	Ø x H (mm)
24 samples + 1 park	70 + 2 rinse + 1 park	50 ml low form	42 x 60	22-45 ml & 8-25 ml	44 x 70
21 samples + 1 park	42 + 2 rinse + 1 park	100 ml low form	48 x 80	-	-
19 samples + 1 park	36 + 2 rinse + 1 park	-	-	40-100 ml	60 x 80
19 samples + 1 park	36 + 2 rinse + 1 park	150 ml low form	60 x 80	-	-
19 samples + 1 park	36 + 2 rinse + 1 park	-	-	GOSSELIN 180 ml	54x72/102
17 samples + 1 park	30 + 2 rinse + 1 park	250 ml tall form	60 x 120	-	-
14 samples + 1 park	25 + 2 rinse + 1 park	250 ml low form	70 x 95	-	-
14 samples + 1 park	25 + 2 rinse + 1 park	400 ml tall form	70 x 130	-	

*Standard glass beakers specified in accordance with DIN 12331 & ISO 3819.

Pump characteristics

Function	Pump type	Flow rate	Accuracy	Pump model/Material
Dynamic spray rinse	Membrane	600 ml/min max.	~10%	Pump head: PP Membrane: PTFE Valve: FFPM (Kalrez®)
Empty beaker			~10%	
Reagent addition	Peristaltic	200-400 rpm 2.0 to 236 ml/min max.	~1%	Tubing: Maprene®

General specifications

Ambient temperature	5 to 40°C
Relative humidity	20 to 80%
Altitude	≤ 2000 m
Casing materials	PETP – PVC/PE - Fully splashproof chemical resistant – For use in a laboratory environment
Level of pollution	2
Power supply	100 - 240 Vac / 50 - 60 Hz / 76 VA
Transitory over voltage	Level II
Dimensions H x W x D (cm)	70 x 58 x 68
Weight (kg)	27
Required operating area (cm)	60 x 80
Compliance	- CE, R&TTE Directive (99/5/EEC), EMC Directive (2004/108/EEC), LV Directive (2006/95/EEC) - cETLus certification, UL 61010A-1 and CAN/CSA C22 2 n°1010.1-92 - FCC part 15 rules

Inputs/outputs

Connector type	Connector description
USB-B (Slave)	PC connection
Sub-D9 RS232C	Connection to titration workstation or direct measurement meter
RJ11	0-5 V TTL input/output commands
RJ11	Beaker cover module
RJ11	Propeller stirrer
Cinch	Temperature input (for use in sample preparation sequence only)
Jack, 3.5 mm	Ultrasonic transducer for beaker detection

Burette Extension

- Customise your system to every application

ABU62

The ABU52 and ABU62 Biburettes come complete with all necessary accessories. Extending your system couldn't be simpler:

Add extra capacity

Each ABU52 or ABU62 gives you two motor-driven burettes, two electrode inputs and one temperature input. Two ABU52s and ABU62s can be connected to a TitraLab workstation, providing up to six titrating burettes and six high-impedance electrode inputs in a single system, meeting every application need. Use the ABU52/62 as an extra titration sample stand or for electrode storage and reconditioning.

Automate your system

The required ABU52/62 burette and installed electrode are selected via methods programmed in the titration workstation, with the system taking charge of precise titrant or reagent dispensing. The large screen display gives you information about reagent status at a glance.

Ensure fast and accurate dispensing

Choose from five monoblock burette sizes: 1, 5, 10, 25 and 50 ml, all conforming to the ISO 8655-3 standard. The full volume can be dispensed in less than 20 seconds, with a resolution as small as 0.1 µl with the 1 ml burette.

Use as a stand-alone dosing unit

The ABU52 can be operated manually by simply connecting a standard PC keyboard. Just fit the right electrode and the ABU52 becomes a versatile manual titration unit. mV/pH readings are shown on the large screen for each titrant increment dispensed along with a live titration curve. Graphic tools enable you to determine the location of your equivalence point(s) manually in order to calculate the final result.

Burette specifications according to ISO 8655-3

Burette stand Type		Nominal volume	Maximum permissible systematic errors		Maximum permissible random errors	
Fixed	Detachable	ml	± %	± µl[a]	± %[b]	± µl[c]
B501	B601	< 1	0.6	6	0.1	1
B505	B605	5	0.3	15	0.1	5
B510	B610	10	0.2	20	0.07	7
B525	B625	25	0.2	50	0.07	17.5
B550	B650	50	0.2	1 00	0.05	25

[a] Expressed as the deviation of the mean of a tenfold measurement from the nominal volume or from the selected volume (see ISO 8655-6:—, 8.4).
[b] Expressed as the coefficient of variation of a tenfold measurement (see ISO 8655-6:—, 8.5).
[c] Expressed as the repeatability standard deviation of a tenfold measurement (see ISO 8655-6:—, 8.5).

Accessories

As TitraLab is a complete solution, we provide all the options required to configure a workstation customised exactly to your application.

TitraLab workstations come complete with a full set of connecting cables, cell accessories, one or two burettes (6) and a comprehensive documentation kit (4) including application notes, a titration theory and practical plastified short-form instructions to guide you through daily tasks.

In addition to sample changers and software, TitraLab includes a wide range of dedicated accessories to complete, maintain and expand your workstation.

1. A complete range of dedicated titration electrodes: acid/base, complexometry, precipitation (silver titration, surfactant), redox
2. Certified pH calibration solutions
3. Electrode maintenance kit
4. Documentation kit
5. Propeller stirring kit
6. Fixed or detachable burettes
7. Photocolorimetric probe
8. Thermostated cells
9. Notebook keyboard and bar code reader
10. Dot matrix and thermal printers


End Point Titration Manager
Operational Qualification
Petroleum Chemical
Plating Bath
Analysis
TitraLab
Titration Workstations
4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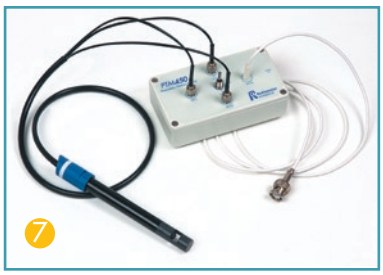
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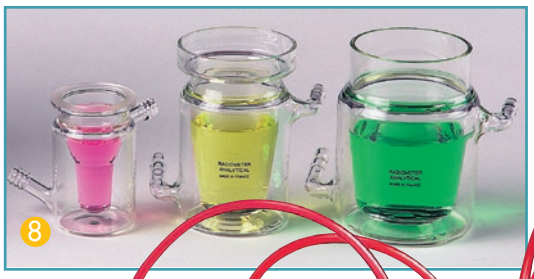
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TIM854 TITRATION MANAGER
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Leading the field in electrochemistry

Radiometer Analytical SAS develops and manufactures an extensive range of electrochemical systems dedicated for routine testing, research and teaching in the laboratory and on the plant.

By supplying instruments, software, sensors and calibration standards, Radiometer Analytical masters the complete measuring chain. Our customers obtain a reliable result at reasonable cost thanks to all-in-one systems that are easy to use and maintain.

The company enjoys a reputation for excellence in the following fields:

pH, ion and conductivity measurements: complete systems for reliable measurements in the field and in the lab including a wide choice of instruments, sensors and standards.

Titration: workstations customised to individual applications including titrators, sample changers and dedicated software.

Voltammetry: all-in systems for electrochemical measurements including potentiostats, impedance meters and powerful software making use of techniques such as voltammetry, amperometry, coulometry, polarography and EIS.

Radiometer Analytical has been building its expertise for more than seventy years, ever since the company pioneered its very first pH meter in Copenhagen, Denmark. This expertise was strengthened by the acquisition of Tacussel, another leading name in electrochemical instrumentation.

Now based in Lyon, France, Radiometer Analytical today belongs to the Danaher Corporation.

The company is part of the Hach Lange Group whose Calibration Laboratory is accredited for the calibration of pH and conductivity standards by DKD, the German national accreditation authority. Radiometer Analytical SAS is ISO 9001 certified.

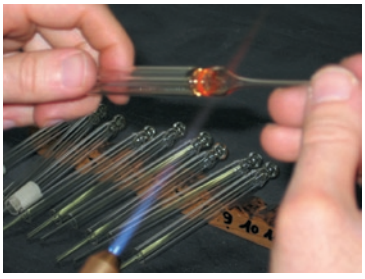
Radiometer Analytical products are distributed worldwide through the Hach and Hach Lange sister companies by a network of experienced specialists, offering comprehensive applications and after-sales service.

Reliable and long-lasting electrodes – the Radiometer Analytical secret

Radiometer Analytical offers a range of more than 300 electrodes - combined pH, glass or reference electrodes, metal electrodes, ion-selective electrodes and conductivity cells - for every application and budget. Electrodes are manufactured on our premises in Villeurbanne, France using a combination of traditional know-how and state-of-the-art technology.

It takes between 2 and 11 days to manufacture a combined pH electrode, depending on the type. The most spectacular stage of the process is the blowing of the glass bulb from a blob of molten glass heated to 1200°C.

To explain just what goes on behind the scenes when a combined pH electrode is manufactured, Radiometer Analytical has produced an informative illustrated article. Ask for a free copy or download it from our web site: **www.radiometer-analytical.com/TTL7**.



Preparing the stem for dipping

Dipping in molten glass

Blowing the glass bulb

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