1. GENERAL INFORMATION

1.1. Product description of TitraLab9xx series and ABU62

TitraLab 9xx series are a Volumetric KF and Potentiometric Titration Workstation.
The TitraLab 980 incorporating a biburette TIM980 which its kind to communicate with its detachable burette stands via wirless RFID technologie.

All the elements are provided for an immediately functional workstation

- A versatile workstation integrating all the functions of a volumetric Karl Fischer and potentiometric titrator with a built-in air
pump module for KF solvent handling
- Two detachable burette stands
- 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
- KF equipment including electrode, cell and accessories
- Four bottle holders for keeping reagents securely in place
- A full set of accessories and cables for easily completing your workstation installation.

ABU62 Biburette

Smart detachable burette stands

New automatic burette communicates with its stands via RFID technology

Take no risks

With the new ABU62, reagent handling is foolproof thanks to the RFID tags located on each stand. As soon as the stand is fitted, the biburette automatically recognises and updates the stored data: reagent name, date of first use and last calibration, expiry date etc. Reagent traceability is greatly simplified and accurate results secured.

Save time and energy

Detachable stand changeover is both fast and reliable thanks to instant data recognition. When not in use, stands are placed directly on their reagent bottle to save bench space.

Add extra capacity

Each ABU62 provides two motor-driven burettes, two electrode inputs and one temperature input. Capacity is significantly extended when two ABU62s are connected to a TitraLab® workstation. The ABU62 can also be used as an extra titration sample stand or for electrode storage and reconditioning.

Automate your system

The required ABU62 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.

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- when you need to be sure...

ABU62 Biburette

The ABU62 Biburette is a complete solution

- Two detachable high-resolution burettes with a wide choice of volumes to add burette capacity to your TitraLab workstation.
- Two high-impedance electrode inputs with differential measurement mode plus one for imposed current to add electrode capacity to your TitraLab workstation or for manual titration.
- A sample stand with stirring to hold and recondition electrodes not in use or to perform manual titration.
- Two bottle holders for keeping reagents securely in place.
- A full set of accessories and cables for easily completing your workstation installation.

Technical specifications

Burette

2 embedded burette stands.
Burette volumes available:
1, 5, 10, 25, 50 ml.
Burette motor: 18,000 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.
Second burette operational during first burette refill.

Inputs/outputs

2 indicator electrode inputs.
1 reference electrode input.
Selectable polarised input from
–1 mA to 1 mA in 1 µA steps, DC or AC.
Differential input.
Temperature input.
Serial connections to titration workstation/PC and second ABU62 Biburette.

Measuring ranges

-9 to 23 pH
±2000 mV
-10 to 100°C

Resolution

0.001 pH
0.1 mV
0.1°C

Languages

English, German, Danish, French, Italian, Spanish and Swedish.

Casing

Fully splashproof latene®.
Graphic 128 x 128 dot LCD (TPX®).

Dimensions (H x W x D) and weight

380 x 230 x 450 mm (excl. tubing).
5 kg (excl. reagent bottles).

International standards (ABU62)

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.
RFID technology complies with R&TTE and FCC part 15 directives.

Power requirements

47.5 – 63 Hz
115/230 Vac +15 -18%.

Environmental conditions

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

Ordering information

ABU62 systems

The ABU62 Biburette includes a full set of connecting cables and sample stand accessories. The following detachable burette stands are available:
1 ml (B601), 5 ml (B605), 10 ml (B610), 25 ml (B625) or 50 ml (B650).

Metrology

To comply with ISO 9001 and ISO 17025 requirements, our metrology department can supply calibration and verification certificates. Our COFRAC accredited laboratory produces pH and conductivity standards with certificates of traceability and conformity.

Burette specifications according to ISO 8655-3

Burette stand	Nominal volume	Maximum permissible systematic errors		Maximum permissible random errors	
Type	ml	± %	± µl[a]	± %[b]	± µl[c]
B601	≤ 1	0.6	6	0.1	1
B605	5	0.3	15	0.1	5
B610	10	0.2	20	0.07	7
B625	25	0.2	50	0.07	17.5
B650	50	0.2	100	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).

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Approved Quality System

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Locating parts in the instrument

1.2. Related Submittal(s) / Grant(s)

All host equipment used in the test configuration are FCC granted, when relevant.

1.3. Tested System Details

The FCC IDs for all equipment, plus description of all cables used in the tested system are :

Trade Mark – Model Number (Serial number)	FCC ID	Description	Cable description
TIM 980* **(sn:** 702R001N002**)**	**UHC-TTL090**	**Titration workstation**	
CHERRY pn:G84-4100PPAFR/02 (sn: C011352M44)	D.o.C.	Keyboard	Shielded cable with ferrite
Dell Latitute CPi pn:	D.o.C.	laptop	Serial cable shielded, power cord unshielded
Dell ADP-70BB model PA-2	none	Power supply	Unshielded cable

Trade Mark – Model Number (Serial number)	FCC ID	Description	Cable description
(sn:)			

*** : Equipment under test**

1.4. Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4-2003, CISPR22-2003 and EN55022:1998+/A1:2000+/A2:2003.
Radiated testing was performed at an antenna to EUT distance of 10 meters. During testing, all equipment's and cables were moved relative to each other in order to identify the worst case set-up.

1.5. Test facility

Tests have been performed on July 12th, 2006.
The test facility used to collect the radiated and conducted data is the **LCIE** (Etablissement Voiron) facility, located ZI des Blanchisseries, 38500 VOIRON, France. This test facility has been fully described in a report and accepted by FCC as compliant with the radiated and AC line conducted test site criteria in ANSI C63.4 in a letter dated July 14, 2005 (registration number 94821).

This test facility has also been accredited by COFRAC (French accreditation authority for European Union test lab accreditation organization) according to NF EN ISO/IEC 17025, accreditation number 1-1633 as compliant with test site criteria and competence in 47 CFR Part 15/ANSI C63.4 and EN55022/CISPR22 norms for 89/336/EEC European EMC Directive application. All pertinent data for this test facility remains unchanged.

1.6. Data sheets of TitraLab 960 and 965

See TIM 980-US.pdf file.

1.7. Data sheets of TitraLab 960 and 965

See TIM 960-965-US.pdf file.

1.8. Data sheets of TitraLab 980

See TIM 980-US.pdf file.

1.9. Data sheets of ABU62

See ABU62-TBr-E.pdf file.

TitraLab® 960 and 965 Titration Workstations

The RFID revolution: a new dimension in potentiometric titration

Smart

- Wireless RFID technology
- Quick-change detachable stands
- Automatic recognition for GLP

Intuitive

- Large display with clear menus
- Live titration curve
- Instantly recognisable status icons

Versatile

- Method coupling
- Sequencing of analyses
- Flexible QC definition

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TitraLab® 960 and 965

Potentiometric Titration Workstations -

The TitraLab 960 and 965 Titration Workstations incorporating the high-performance monoburette TIM960 or biburette TIM965 are the first titrators of their kind to 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.

Take no risks

Wireless burette stand communication simplifies GLP compliance

With the new TitraLab 960 and 965, reagent handling is foolproof thanks to the RFID tags located on each stand. As soon as the stand is fitted, the workstation automatically recognises and updates the stored data: reagent name, date of first use and last calibration, expiry date etc. Reagent traceability is greatly simplified and accurate results are secured.

Follow simple instructions

Intuitive interface guides you at every step

Your titration workstation prompts you through each stage of operation with clear-text messages in a choice of languages. The user-friendly assistant function helps you navigate efficiently through application development and implementation.

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

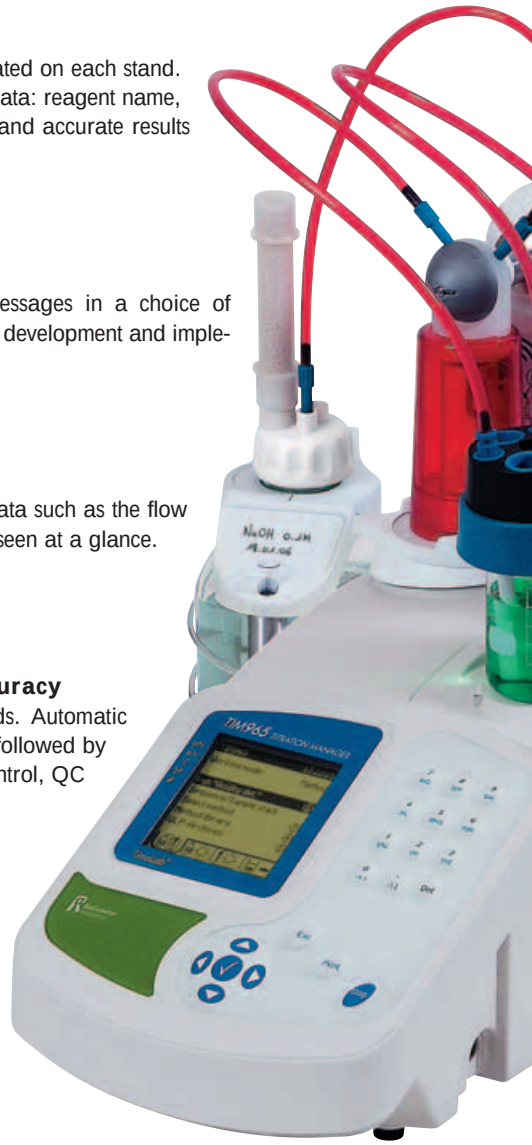
Versatile programming and a high-resolution burette ensure speed and accuracy

The TitraLab 960 and 965 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.

Save time and energy

Detachable stand changeover is fast and reliable

For convenient installation and maintenance, the detachable monobloc burette stands are mounted in no time. When not in use, stands are placed directly on their reagent bottle to save bench space. Electrodes and tubing slot securely in place in one easy movement thanks to our unique bayonet concept.



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 ABU62 Biburettes.

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.titration.com** to get the latest updates on customised solutions for your application.

TitraLab: a totally reliable solution

All the elements are provided for an immediately functional workstation

- A versatile, full-featured titration manager
- One or two detachable burette stands
- 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
- One or 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® 960 and 965

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.
- 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.
- Direct pH/mV measurements with recording on stable reading.
- Titration modes: direct, back, with blank, with QC, repeat measurements.
- Sequencing of up to 10 methods within a sample changer or analysis series.
- Coupling of 2 to 8 methods.
- Automatic or manual reprocessing of last titration method.

Measuring range / Resolution

Measuring range	Resolution
-9.00 to 23.00 pH	0.001 pH
±2000 mV	0.1 mV
-10°C to +100°C	0.1°C

GLP printout

Automatic with 3 levels of detail.
Selectable: no, 80 columns.
Continuous, page to page.

Results

Automatic calculation of up to 8 results in the chosen unit.
2 equations with user-defined result units.
User-defined result IDs.
QC check on results with visual alarm.
Statistical calculations.

Storage capacity

Non-volatile memory.
User programmable: 50 methods.
Storage of last 200 results and last 100 calibrations.
Libraries for 30 electrodes and 30 reagents: pre-identified with ID and type.

Data security and GLP

Methods protected by password.
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, 22 reproducible speeds (0 to 1100 rpm) in 50 rpm steps.
Propeller connection.
Beaker volume: 5 to 400 ml.

Burette

1 detachable burette stand - TIM960.
2 detachable burette stands - TIM965.
Burette volumes available: 1, 5, 10, 25, 50 ml.
Burette motor: 18000 steps.
Complies with ISO 8655-3.
UV-protected encapsulated glass syringe.
Burette stands: up to 6 with 2 ABU62s.
Air bubble removal, rinse-fill-empty functions.

Inputs/outputs

2 indicator electrode inputs.
1 reference electrode input.
Selectable polarised input from -1 mA to 1 mA in 1 µA steps, DC or AC.
Differential measurement mode.
Temperature input.
0-5 V TTL output.
0-12 V TTL output.
TTL input to start analysis.
Electrode inputs: up to 6 with 2 ABU62s.
Serial connections for Printer/PC, balance and sample changer.
PS/2 port for PC keyboard and/or barcode reader.

Languages

English, German, Danish, French, Italian, Spanish and Swedish.

General specifications

Casing:
Fully splashproof latene®.
Graphic 128x128 dot LCD (TPX®).
Alphanumeric keypad (silicone).

Dimensions (H x W x D):
380 x 230 x 450 mm (excl. tubing).

Weight: 5 kg (excluding reagent bottles).

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

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

International standards (TIM960 and 965):
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.
RFID technology complies with R&TTE and FCC part 15 directives.

Ordering information

TitraLab systems

The TIM960, NB or TIM965,NB Potentiometric Titration Workstation consists of the TIM960 pH/EP/IP Titrator, monoburette or the TIM965 pH/EP/IP Titrator, biburette delivered with a full set of connecting cables and cell accessories but no stand. The following detachable burette stands are available: 1 ml (B601), 5 ml (B605), 10 ml (B610), 25 ml (B625) or 50 ml (B650).

Metrology

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

Applications

The TitraLab 960 and 965 Titration Workstations, used in conjunction with our comprehensive range of electrodes and accessories, are ideal for performing the majority of industrial aqueous and non-aqueous titrations:

- Acid/base titration in aqueous or non-aqueous media
- Complexometric titrations
- Argentimetric titration (halides and silver)
- Redox titration (zero and imposed current)
- Photocolorimetric titrations
- Precipitation titrations

Consult the full list of dedicated applications developed by our Applications Chemist at
www.titration.com

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TitraLab® *980* Titration Workstation

The RFID revolution: a new dimension in potentiometric and Karl Fischer titration

Smart

- Wireless RFID technology
- Quick-change detachable stands
- Automatic recognition for GLP

Intuitive

- Large display with clear menus
- Live titration curve
- Instantly recognisable status icons

Versatile

- Method coupling
- Sequencing of analyses
- Flexible QC definition

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- when you need to be sure...

TitraLab® 980

Volumetric KF and Potentiometric Titration Workstation -

The TitraLab 980 Titration Workstation incorporating the high-performance biburette TIM980 is the first titrator of its kind to communicate with its 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.

Enjoy the best of both worlds

Combined volumetric Karl Fischer and potentiometric titrator gives you outstanding performance

The TitraLab 980 includes two full-featured titrators in the same workstation: a standard potentiometric plus a volumetric Karl Fischer titrator. Implementation of the latest technology ensures safe and efficient titrimetric analyses and water content determination. Solvent addition and cell emptying are performed in a matter of seconds using large suction tubes.

Take no risks

Wireless burette stand communication simplifies GLP compliance

With the new TitraLab 980 reagent handling is foolproof thanks to the RFID tags located on each stand. As soon as the stand is fitted, the workstation automatically recognises and updates the stored data: reagent name, date of first use and last calibration, expiry date etc. Reagent traceability is greatly simplified and accurate results are secured.

Follow simple instructions

Intuitive interface guides you at every step

Your titration workstation prompts you through each stage of operation with clear-text messages in a choice of languages. The user-friendly assistant function helps you navigate efficiently through application development and implementation.

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

The TitraLab 980 provides 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.

Save time and energy

Detachable stand changeover is fast and reliable

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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 ABU62 Biburettes.

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Ensuring the right choice for your application

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- A versatile workstation integrating all the functions of a volumetric Karl Fischer and potentiometric titrator with a built-in air pump module for KF solvent handling
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- KF equipment including electrode, cell and accessories
- Four bottle holders for keeping reagents securely in place
- A full set of accessories and cables for easily completing your workstation installation.

Technical Specifications

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.
- Volumetric KF titration.
- 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
- Direct pH/mV measurements with recording on stable reading.
- Titration modes: direct, back, with blank, with QC, repeat measurements.
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±2000 mV	0.1 mV
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2 equations with user-defined results units.
User-defined result IDs.
QC check on results with visual alarm.
Statistical calculations.

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Non-volatile memory.
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Storage of last 200 results and last 100 calibrations.
Libraries for 30 electrodes and 30 reagents: pre-identified with ID and type

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Methods protected by password.
Embedded operating procedures for electrode and reagent exchange.
Automatic electrode, titrant calibration and QC prompt.

Electrode stand - stirring

Magnetic stirrer, 22 reproducible speeds (0 to 1100 rpm) in 50 rpm steps.
Propeller connection.
Beaker volume: 5 to 400 ml.
KF cell volume: 35 to 150 ml ±5 ml.

Sample list

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

Pneumatic circuit functions

Built-in air pump module.
Solvent addition and cell emptying.

Burette

2 detachable 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.
Burette stands: up to 6 with 2 ABU62s.
Air bubble removal, rinse-fill-empty functions.

Inputs/outputs

2 indicator electrode inputs.
1 reference electrode input.
Selectable polarised input from -1 mA to 1 mA in 1 µA steps, DC or AC.
Differential measurement mode.
Temperature input.
0-5 V TTL output.
0-12 V TTL output.
TTL input to start analysis.
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CSA Standard C22 2 No. 1010.1-92.
RFID technology complies with R&TTE and FCC part 15 directives.

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

Ordering information

TitraLab system

The TIM980, NB Potentiometric Titration Workstation consists of the TIM980 pH/EP/IP/KF Titrator, biburette delivered with a full set of connecting cables and cell accessories but no stand. The following detachable burette stands are available: 1 ml (B601), 5 ml (B605), 10 ml (B610), 25 ml (B625) or 50 ml (B650). The equipment required for KF titration (cell, electrode, accessories) is also supplied.

Metrology

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

Applications

The TitraLab 980 Titration Workstation, used in conjunction with our comprehensive range of electrodes and accessories, are ideal for performing the majority of industrial aqueous and non aqueous titrations:

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- Complexometric titrations
- Argentimetric titration (halides and silver)
- Redox titration (zero and imposed current)
- Photocolorimetric titrations
- Volumetric Karl Fischer titrations

Consult the full list of dedicated applications developed by our Applications Chemist at
www.titration.com

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Système Qualité Certifié

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