

# 831 KF Coulometer

Never before has coulometric Karl Fischer water determination been so economical!



The advantages of our new 831 KF Coulometer will convince you:

- Favorable price
- Highest precision
- Graphics display for real-time titration curve
- Expandable to a fully automated analysis system
- Metrodata software programs give access to the PC and titration networks
- **PC software VESUV Light included!**

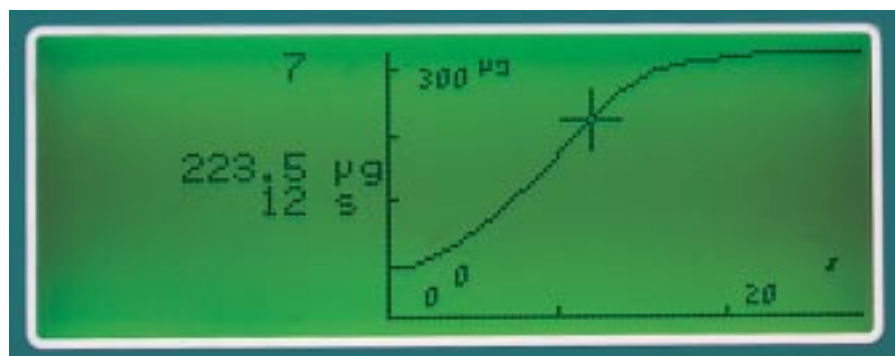
## Affordable KF water determination

### Precise and inexpensive – no contradiction in terms!

Metrohm's 831 KF Coulometer sets new standards regarding price-performance ratio. Despite its exceptionally favorable price, the youngest member of our Karl Fischer instrument range leaves no wish unfulfilled. The 831 KF Coulometer guarantees precise and accurate results even in the low microgram region. Its additional assets are compact construction, flexibility and easy operation.

The table shows the precision that can be reached with the 831 KF Coulometer. The results were obtained using Karl Fischer standards of varying concentration.

| Water content | Precision      |
|---------------|----------------|
| 10...1000 µg  | ±3 µg          |
| >1000 µg      | 0.3% or better |



LCD screen of 831 KF Coulometer with curve  $m(\text{H}_2\text{O})$  in microgram versus the time in seconds.

### Graphics display with real-time curve

On the 831 KF Coulometer's backlit LCD screen the user can follow graphically the course of the Karl

Fischer water determination ( $\mu\text{g}$  water as a function of time). In addition the curves «voltage vs. time» and «drift vs. time» can be printed out or viewed on the PC screen. These features allow you to assess the determination and assist method development.

### The 831 KF Coulometer in routine operation

Often it is felt that an instrument offering extensive capabilities cannot be easy to operate. The 831 KF Coulometer solves this problem by placing at your disposal an expert and a standard mode. In the standard mode only those functions are accessible that are needed in routine work. Operation in this mode requires very few keystrokes and is extremely easy.

### Communication and automation

The 831 KF Coulometer is equipped with two RS 232C interfaces that allow the attachment of a balance, printer and PC. The «Remote» interface opens up further possibilities: In combination with a 774 Oven Sample Processor, the 831 KF Coulometer can be expanded to a fully automated analysis system. Needless to say, the new 831 KF Coulometer is compatible with the current Metrodata software programs TiNet 2.5 and VESUV 3.0.



The new 831 KF Coulometer offers highest precision at a favorable price.

## All-embracing flexibility

### NEW: PC software included!

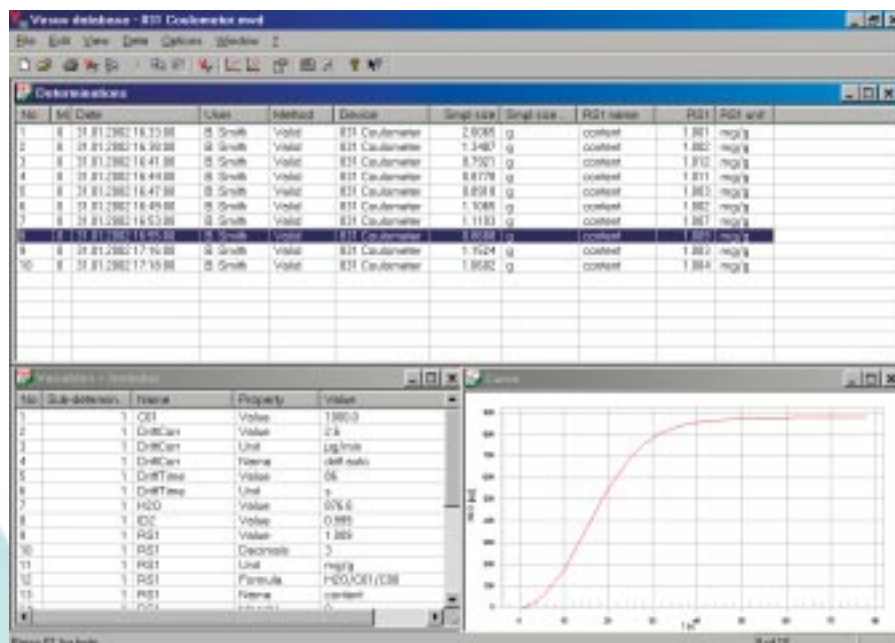
With the 831 KF Coulometer you get, at no extra cost, the Metrodata software VESUV 3.0 Light, an easy-to-operate program for the acquisition and reprocessing of data. The measuring values and results supplied by the 831 KF Coulometer are transferred into a database and presented in a clearly arranged form with the corresponding curve «m(H<sub>2</sub>O) vs. time» and the report.

### Quality management with Metrohm

The 831 KF Coulometer allows the complete and clear documentation of all the determinations performed. The result output complies with GLP and includes designation and serial number of the instrument, software version, date, user name and method used.

GLP and ISO 9000 functions such as service or validation intervals alert the user in time for the necessary tests. The KF reagent can be monitored with regard to the number of determinations carried out, its useful life span, drift value or capacity. Whenever the reagent has to be exchanged, the corresponding request is issued automatically. To avoid mishaps of any kind there is the additional possibility of setting limits for the sample weight or volume and for the result. If one of these quantities lies outside the set limits, the corresponding warning message appears in the display and report and the «Remote» interface emits a signal.

The 831 KF Coulometer puts at your disposal a special GLP mode that facilitates the periodic testing of the instrument: Simply call up this mode and carry out the validation according to Metrohm Application Bulletin no. 273.



PC screen with VESUV database.

### Thermal sample preparation

Use of a KF Oven is recommended for samples that cannot be introduced directly into the KF cell. Metrohm offers two different ovens. The 768 KF Oven can be used if few samples have to be processed. However, if large numbers of samples need to be analyzed, the 774 Oven Sample Proces-

sor is the ideal solution. When combined with the 831 KF Coulometer, this sophisticated sample changer allows fully automated water determinations in up to 35 samples. The analysis system can be operated as a stand-alone unit or controlled completely by the Metrodata software TiNet 2.5.



831 KF Coulometer with 774 Oven Sample Processor: fully automated, fast and highly precise KF water determinations right down to the trace level.

## The features at a glance

The 831 KF Coulometer is easy to operate and offers:

- Routine and expert mode
- Four tested determination methods are stored in the instrument
- Internal memory for approx. 100 user methods
- Result management: Take advantage of the instrument's result memory. Per method, up to nine results can be calculated and stored separately. It is also possible to recalculate results and to assess them with the instrument software's statistics functions.
- Comprehensive automation with the 774 Oven Sample Processor.
- PC keyboard and barcode reader can be attached.

The PC software VESUV 3 Light forms part of the 831 KF Coulometer's package.

LCD screen for user guidance and display of parameters, live curves and results.

Separate keypad for parameter settings; routine operation requires only three keys on the front panel.



Automatic reagent exchange: With a 700 Dosino the spent KF solution can be replaced automatically by fresh solution. As the cell remains closed during this operation, no humidity can enter and the cell is conditioned and ready for use in a very short time.



Generator cells for the 831 KF Coulometer: without diaphragm on the left, with diaphragm on the right.

Cell with or without diaphragm – the choice is yours! The 831 KF Coulometer is available with two different types of generator cells. The diaphragm-less variant needs only one reagent and requires practically no maintenance. It can be used for a large number of applications. Use of the generator cell with diaphragm is recommended in the following cases: Water determinations in aldehydes and ketones, extremely low water contents and samples with very low conductivity, e.g. oils.

## The capabilities of the 831 KF Coulometer

|  |  |
|--|--|
| <b>General features and scope</b>                              |  |
| Range of water contents  | 10 µg ... 200 mg                                     |
| Solid, liquid and gaseous samples                              | ●  |
| Number of ready-for-use methods                                | 4  |
| Number of user methods that can be stored                      | Up to 100  |
| Automation with 774 Oven Sample Processor                      | ●  |
| <b>Determination</b>   |  |
| Automatic conditioning   | ●  |
| Drift stop as endpoint criterion (relative and absolute drift) | ●  |
| Drift determination  | ●  |
| Real-time curve during titration                               | ●  |
| Autostart after sample introduction                            | ●  |
| <b>Result calculation and output</b>                           |  |
| Number of results per method                                   | 9  |
| Statistics (up to 20 determinations)                           | Mean value, relative and absolute standard deviation |
| Recalculation of results                                       | ●  |
| Curve printout   | V-t, U-t, drift-t                                    |
| Result storage   | ●  |
| <b>GLP functions</b>   |  |
| GLP-compliant documentation                                    | ●  |
| Routine mode with restricted user rights                       | ●  |
| Titrator identification by its serial number                   | ●  |
| Validation and service intervals                               | ●  |
| GLP method for validating the KF Coulometer                    | ●  |
| <b>Dialog languages</b>  |  |
| English, German, French, Spanish, Italian, Portuguese, Swedish | ●  |
| <b>Interfaces</b>  |  |
| 2 RS 232 connections for balance, printer or PC                | ●  |
| «Remote» connection  | ●  |
| Stirrer connection   | ●  |
| Connection for 700 Dosino for automatic reagent exchange       | ●  |
| <b>Hardware</b>  |  |
| Backlit LCD  | ●  |
| Separate keypad  | ●  |
| Coulometric cell with 250 mL glass vessel                      | ●  |
| Double platinum electrode                                      | ●  |
| Measuring input for polarized electrode                        | ●  |
| Generator electrode available with or without diaphragm        | ●  |

## Ordering information, options

### Ordering information

#### 831 KF Coulometer

Compact Karl Fischer titrator with coulometric reagent generation, for KF water determinations down to the microgram range in liquids, solids and gases; absolute method, therefore no titer determination required.

**2.831.0010** 831 KF Coulometer with **diaphragm cell**, 728 Magnetic Stirrer and comprehensive accessories; includes Metrodata PC software VESUV 3.0 Light.

**2.831.0110** 831 KF Coulometer with **diaphragm-less cell** and comprehensive accessories (without stirrer); includes Metrodata PC software VESUV 3.0 Light.

### Options

#### Titration stand

**2.703.0010** 703 Titration Stand with built-in magnetic stirrer and pump for exchanging the titration vessel contents

6.1439.010 Tube for addition or siphoning with the 703 Titration Stand (diaphragm-less cell)

6.1805.200 Additional PTFE tubing with two M8 screw nipples for 703 Titration Stand

#### Magnetic stirrer

**2.728.0010** 728 Magnetic Stirrer (included in delivery of 2.831.0010 KF Coulometer)

#### Dosino and Dosing Unit for Liquid Handling (diaphragm-less cell)

**2.700.0020** Dosino

Drive for Dosing Unit, with fixed cable (mini DIN plug); is mounted together with the Dosing Unit directly onto bottles with GL45 glass thread. Aspirates spent solution and adds fresh reagent to the 831 KF Coulometer's cell.

6.5617.000 Equipment for automatic reagent exchange, including 50 mL Dosing Unit and 6.2055.100 holder for two bottles

#### Remote Box, bottle holder and connecting cables for PC, printer and balance

6.2148.000 Remote Box for connecting a barcode reader and a PC keyboard to the 831 KF Coulometer

6.2055.100 Holder for two bottles (max. 1 L), height adjustable; for reagent and waste bottle when using the 703 Titration Stand (is not needed when working with the 700 Dosino and the 6.5617.000 equipment, as this latter already contains the 6.2055.100 bottle holder.

6.2125.110 Cable for PC with 25-pin connector (DB25)

6.2134.040 Cable for PC with 9-pin connector (DB9)

6.2134.050 Cable for Epson FX, LX, LQ printer

6.2134.100 Cable for Custom DP40 printer

6.2146.020 Cable for Mettler AM, PM, AT balances

6.2134.060 Cable for Sartorius MP8 and MC1 balances (RS 232C)

#### 768 KF Drying Oven

Oven for coulometric or volumetric KF titrators, with motor-driven sample transfer and built-in air pump. Temperature range 50...300 °C. The built-in RS 232C interface allows to connect a printer or a PC. The instrument can be remote-controlled via its «Remote» I/O lines.

**2.768.0010** 768 KF Drying Oven including pump and comprehensive accessories

6.2141.010 Connecting cable 831 KF Coulometer – 768 KF Drying Oven

6.1830.000 Heatable outlet tubing

6.1446.170 Stopper for heatable outlet tubing when working with the diaphragm-less coulometric cell

**2.774.0010** **774 Oven Sample Processor**

Highly flexible instrument combining sample changer, oven and gas pump. Accommodates 35 sample vessels (20 mm aluminum seal headspace vials) and one conditioning vessel. Programming and manual operation via keypad equipped with a two-line LCD. Including comprehensive accessories.

## Ordering information, options (ctd.)

### Software

#### *Metrodata VESUV® 3.0*

- 6.6008.200 Metrodata VESUV 3.0, including Hardware Dongle, for n instruments
- 6.6008.500 Metrodata VESUV 3.0 Light, including Hardware Dongle, for max. 2 instruments (included in delivery of 831 KF Coulometer)
- PC program (Windows™ 95, 98, NT, 2000 or XP) for the acquisition of titration data via an RS 232C interface, method backup, printing of reports, curve display and reprocessing of data. Database with filter, search and query functions, data export to Excel, Lotus, LIMS... Dialog in English or German.

#### *Metrodata TiNet® 2.5*

- 6.6012.150 Metrodata TiNet 2.5, for n instruments
- 6.6012.550 Metrodata TiNet 2.5 Light, for max. 2 instruments
- Comprehensive, user-friendly PC program (Windows™ 95, 98, NT, 2000 or XP) for the freely programmable control of high-performance titration networks. Complies with FDA 21 CFR Part 11.
- Creation and storage of methods
  - Non-S-shaped curves can be evaluated manually or automatically
  - Export to database programs, e.g. Access, Excel, or to a LIMS
  - Display, printing and storage of curves and results
  - Dialog and instructions for use in English or German
  - Includes TiNet Hardware Dongle



 **Metrohm**  
Ion analysis

**Metrohm Ltd. CH-9101 Herisau**  
Switzerland

Phone +41 71 353 85 85  
Fax +41 71 353 89 01  
E-Mail [info@metrohm.com](mailto:info@metrohm.com)  
Internet [www.metrohm.com](http://www.metrohm.com)

Subject to modifications  
Printed in Switzerland by Metrohm Ltd., Herisau  
8.831.6003 – 2002-05