

# Karl Fischer Titrator



## **Areas of application:**

- Petrochemical • Pharmaceuticals
- Cosmetics/Toiletries • Food/Beverage
- Chemicals • Power (electricity)
- Automotive • Agriculture
- Universities • Contract Laboratories



## **Aquamax KF Volumetric**

### **Features and Benefits**

- Very easy to use - intuitive keypad and function guide display
- Automatic and periodic elimination of bubbles which can form in the liquid circuit
- Automatic drift monitoring and compensation
- Flexible - can be used with different reagent brands
- 2 x 5ml syringes – one for the KF reagent and other for automatic dosing of standard for the titre (second syringe can also be used for different factor reagent or special reagents for ketones, amines, etc.) Syringe volume dispensed in 40,000 steps
- 2 x built-in pumps - one for dispensing the solvent and other for emptying the vessel
- Automatic rest cycle (stand-by mode) if not used for 15 minutes
- Programmable – several easy to use programs for titration and standardisation
- Results expressed in ppm, mg/l, %, etc.
- Connects to external pc keyboard for easy text and sample information data entry
- Connects to different types of printers, pc and balances
- Data Logger – automatic data storage of last 55 analysis results

## Technical Specifications

<b>Non-volatile memory:</b>	Up to 10 titration programs, Clock/calendar, Header texts: 2 lines x 40 characters. Name of up to 4 operators Program comments: 8 lines x 40 characters Up to 55 results stored in Data Logger
<b>Languages:</b>	English, Spanish, French, Italian
<b>Display:</b>	Graphic backlit LCD, 128 x 64 dots
<b>Keypad:</b>	Membrane, 7 keys, guaranteed up to 6 million strokes per key,
<b>Material:</b>	PET with protective treatment
<b>Measuring ranges:</b>	From 0.1 mg up to 100% water
<b>Syringe volume:</b>	Standard syringe 5ml
<b>Resolution:</b>	1/40000 of syringe volume
<b>Dispensing accuracy:</b>	(as relative error) $\leq 0.2\%$ for volumes higher than 10 % of the syringe
<b>Dispensing reproducibility:</b>	$\pm 0.1\%$ for volumes higher than 10 % of the syringe
<b>Liquid contact materials:</b>	Syringe: borosilicate glass and PTFE Electrovalve : PTFE and KEL-F. Tubes: PTFE
<b>Inputs and outputs:</b>	Polarised electrode, BNC connector. For external keyboard, miniDIN connector. RS232C bidirectional for PC or printer, telephone connector. RS232C for balance, telephone connector Stirrer control: On/Off and speed, RCA connector
<b>Power supply:</b>	90-264 VAC, 47-63 Hz, 24 V DC
<b>Electrical safety:</b>	Meets EC, EN 61010
<b>EMC:</b>	Meets EC, EN 50081-2 and EN 50082-2
<b>Permitted temperatures:</b>	Operating: 15 – 40 °C. Storage: -10 – 50 °C $\leq 80\%$ , relative humidity, non condensing
<b>Enclosure:</b>	ABS and enamelled steel

**Physical parameters:** Weight: 4 kg approx.

Dimensions: 130 x 160 x 300mm

## How does it work?

### Usual procedure is

1. **Automatic dispensing** of the required volume of solvent into titration vessel
2. **Neutralisation**– initial titration to remove water from the solvent
3. **Drift monitoring**– after titration has concluded, the Aquamax KF automatically determines the vessel drift. This value is then deducted from later titration. The Aquamax KF will prompt the user if the measured drift value is greater than the programmed limit value.
4. **Standardisation of titrant reagent** – 4 standardisation methods can be selected by user. The Aquamax KF determines the reagent factor and automatically stores it in the titration programs.
5. **Titration of the sample** – the Aquamax KF prompts user to introduce the sample. Titration commences immediately or after programmed extraction period.
6. **Results** – Calculated results are displayed on the Aquamax KF screen, stored in the Data Logger and also sent to a printer or pc.
7. **Emptying the vessel** – The Aquamax KF can often perform several titrations on the same solvent. The built-in pump can be used to transfer the vessel contents directly to a waste container.
8. **Next sample**– if no other samples are analysed within 15 minutes the Aquamax KF will go into Rest Cycle (stand-by mode).

### Rest cycle

If the Aquamax KF is not used for 15 minutes it will automatically go to stand-by mode.

### Elimination of bubbles

Using a novel control of the syringe, the Aquamax KF eliminates the well known problem of bubble formation in the reagent circuit

## **2 x 5ml syringes**

One for the KF reagent and other for automatic dosing of standard for the titre. Second syringe can also be used for automatic dosing of a standard for titre determination or for other factor reagents or special reagents

## **2 x Electrovalves**

These are fitted to top of each syringe and control flow direction of solvent and reagents

## **2 x Peristaltic pumps**

One used for solvent dispensing, other used for emptying titration vessel

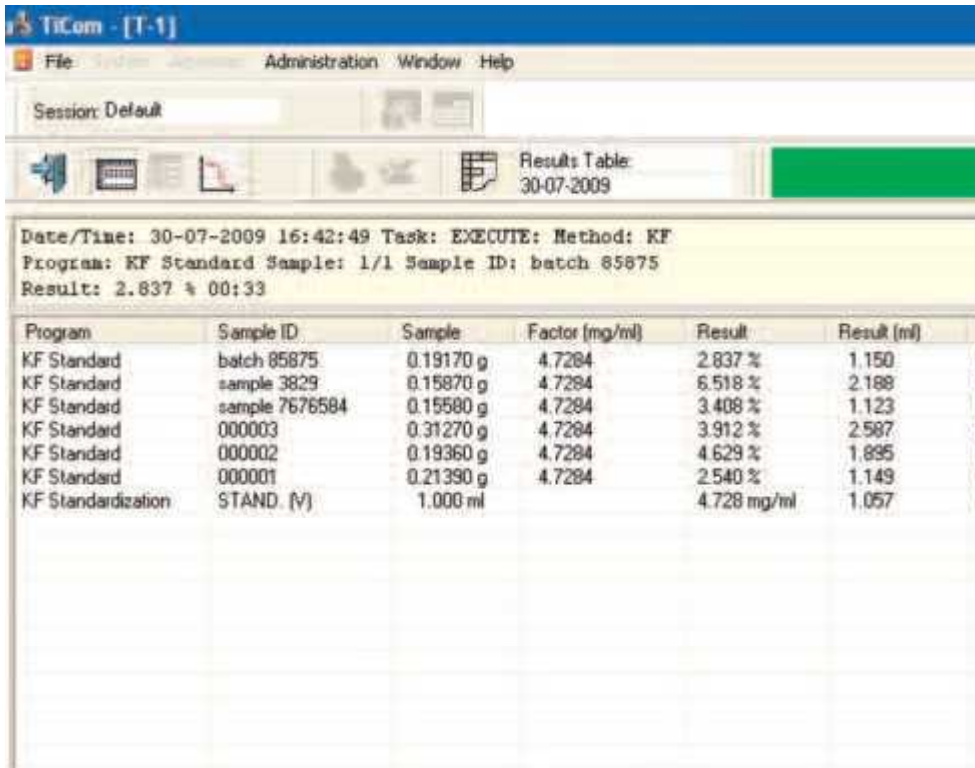


## Printer (optional)



Following data will be printed (or sent to PC) after a titration or standardisation: Header, date and time, reagent factor, drift value, sample ID code, titration result, final volume, titration duration, user name.

## TiCom Software (optional)



The screenshot displays the TiCom software interface. At the top, there is a menu bar with 'File', 'Administration', 'Window', and 'Help'. Below the menu bar, the session is identified as 'Default'. A toolbar contains several icons, including a printer and a magnifying glass. The main window shows a 'Results Table' for the date 30-07-2009. Below the toolbar, a status bar provides the following information: Date/Time: 30-07-2009 16:42:49, Task: EXECUTE, Method: KF, Program: KF Standard, Sample: 1/1, Sample ID: batch 85875, and Result: 2.837 % 00:33. The main area of the window is a table with the following data:

Program	Sample ID	Sample	Factor (mg/ml)	Result	Result (ml)
KF Standard	batch 85875	0.19170 g	4.7284	2.837 %	1.150
KF Standard	sample 3829	0.15870 g	4.7284	6.518 %	2.188
KF Standard	sample 7676584	0.15580 g	4.7284	3.408 %	1.123
KF Standard	000003	0.31270 g	4.7284	3.912 %	2.587
KF Standard	000002	0.19360 g	4.7284	4.629 %	1.895
KF Standard	000001	0.21390 g	4.7284	2.540 %	1.149
KF Standardization	STAND. (V)	1.000 ml		4.728 mg/ml	1.057

Communications software between Aquamax KF Volumetric and PC Allows viewing and printing of all calculation input, calibration and titration measurement data. Reports on multiple samples can be generated directly and exported to Excel or Access.

## Certificates

All Aquamax KF Volumetric are supplied with:

- EC Declaration of conformity according to directive C.E.M. 89/336/CE
- Calibration test of dispensed volume with the syringe
- Specifications certificate and mV measuring test.