

Karl Fischer titrators.
The TitroMatic KF makes it easy.
With maximum accuracy and quickness.



Karl Fischer titrator

TitroMatic KF

Three versions.
From the simplest to the most complete model on the market.

Their advantages:

- Very easy to be used, with intuitive keypad and function guide display.
- Automatic and periodic elimination of the bubbles which form in the liquid circuit.
- Intelligent vessel drift monitoring with different possibilities to compensate it.
- Flexible adapting to the different brands of reagents on the market.
- Much more reliable than other more complex equipment.
- The analysis speed is higher than its competitors.
- It is more than reasonably priced.

Key features:

- Programmable. Several programs for titration and standardization.
- The results can be expressed in ppm, mg/l, % and others.
- Real time clock calendar.
- Connection for external PC key board, making easy the text and sample code introduction.
- Two RS 232 C interfaces, one for connecting to a printer or PC, and the other for connection to balance.
- Possibility to connect a bar-code scanner for sample identification.
- *Data Logger*, data storage of the last 50 analyses results.

Titration modes:

- Standard, for reagents with different factor.
- Special for samples with water content < 1%.
- Special for samples with high water amount > 10%.
- Special for aldehydes and ketones.
- Titrant reagent standardization.

Burette self-calibration

The TitroMatic offers a program for the calibration of the dispensed volumes, in accordance with the norm UNE-EN ISO 8355.

An analytical balance is required.

Three versions (see page 5)

TitroMatic 2S 2B
(2 syringes + 2 pumps)



How does it work?

The usual procedure is:

- 1 Dispensation of the solvent into the titration vessel.
- 2 Neutralisation of the medium. Initial titration to remove water from the solvent.
- 3 Automatic drift monitoring.

Once any titration has concluded, the **TitroMatic** automatically determines the vessel drift. During later titration, it will deduct the amount of the drift from the volume consumed.

Safety First! When the value of the determined drift is greater than the established value, the **TitroMatic** notifies the user and prevents him/her performing another titration.

- 4 Standardisation of the titrant reagent.

Different standardization products can be used: sodium tartrate-2-hydrate, distilled water or specific commercial standards. The **TitroMatic** determines the reagent factor and automatically memorises it in the titration programmes.

Statistics. If wished, the instrument doubles or triples determination by applying statistical calculations to the data and memorises the mean value of the factor it finds.

- 5 Titrating the sample.

The instrument notifies the user when he/she should place the sample in the titration vessel. Titration commences immediately or after a prior period of extraction, if the characteristics of the sample so require.

The weight of the sample can be keyed in manually or be sent from a balance.

- 6 The results...

The results obtained after analysing each sample are displayed clearly on the **TitroMatic** screen.

Statistical results. The instrument has statistical functions implemented to calculate the mean value and standard deviation of the analysed samples.

Data Logger. At the same time as it displays the results on screen the instrument stores all the results obtained, up to a maximum of 50 samples, in memory. Data relating to the last 50 samples can be queried at any time.

Printer. Connecting the unit to a printer means that the user can obtain a printed report of all performed operations.

PC. Most users file their results on a PC these days. This can also be done with **TitroMatics**. The **TiCom** communications software makes short work of this.

- 7 Emptying the vessel.

The **TitroMatic** can perform several titrations on the same solvent. However, the medium usually needs to be changed after two or three determinations.

This can be done manually or using a peristaltic pump, depending on the version.

- 8 Next sample, if it is to be analysed straight away. Otherwise, the titrator goes to "stand by" mode after 10 minutes.

Rest cycle

If the instrument is not used for a certain length of time, it automatically switches to "stand cycle".

When the instrument is next used the vessel is automatically prepared.

Elimination of bubbles

With an ingenious movement of the syringe, the **TitroMatic** eliminates the well-known problem of bubble formation in the reagent circuit.

Version with 2 syringes

The **TitroMatic 2S 2B** incorporates 2 syringes.

The possible functions of the second syringe are:

- Automatic dosing of a standard for the titre determination.
- Titration with a second reagent, special for aldehydes and ketones or with different factor.

Peristaltic pumps

Incorporated in the versions 2B (2 pumps)

They are used for:

- Solvent dispensing.
- Reaction vessel empty.



The peristaltic pumps are placed on the rear panel (open).

Data visualization

Display examples

Titration, program 1

```

P1 KF TITRATION
Conditioning vessel
0.001 ml
00:60 8 ul/min
*PLEASE WAIT*
    
```

Informative display

Wait for a new message

The action messages appear in negative text.

Standardisation

```

KF STANDARDIZATION
1.058 ml
00:10 00:28 5 ul/min

F=4.726 mg/ml
Accept result
Repeat sample
    
```

First display: in process

Second display: process end. The determined factor appears and 2 options are offered.

Rest cycle

```

P1 KF TITRATION

Rest cycle
12:15
21-07-03 12:16:10
Start titration
    
```

The screen displays how long the stand cycle has been activated, 12 min 15 s

Below, the date and the hour.

In negative text, the suggested action.

Data Logger.

```

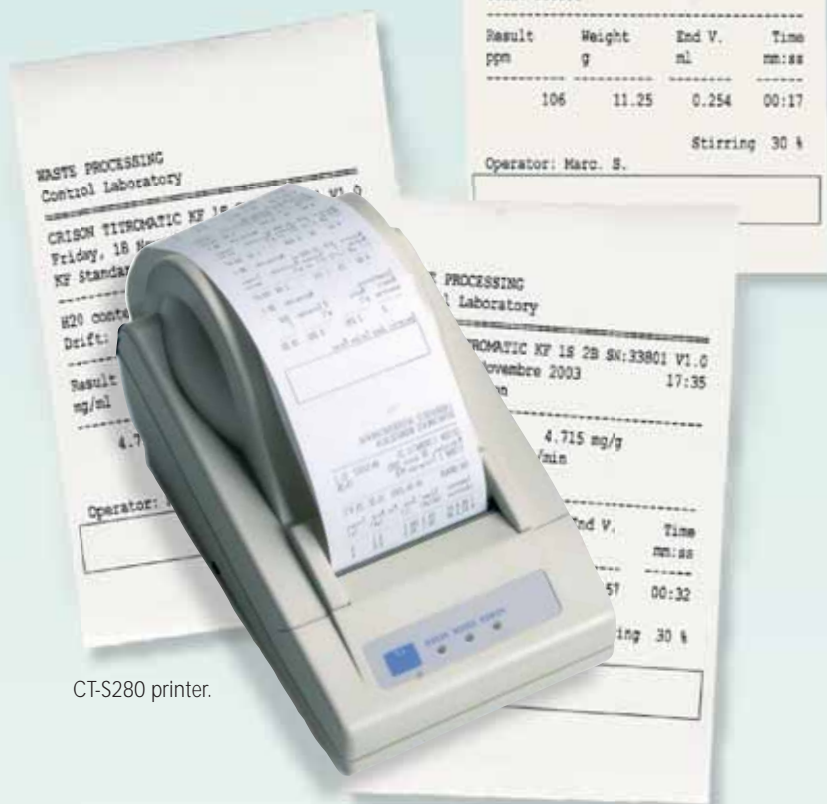
DATA LOGGER
▲ 16 Analysis
C: Solvent
28-07-03 10:12:05
KF Titration
▼ G: 1.032
F= 4.726 mg/ml
R: 0.51 %
FV: 1.058 ml 00:29
▼ Operator: P.Gomez
    
```

Screens corresponding to one analysis (position 16 in the *Data Logger*).

All data appear in accordance with the GLP.

Printer, optional

Using the printer, all performed tasks are registered.



CT-S280 printer.

TiCom Software, optional

Communications software between TitroMatic series titrators and PC.

Key features

Monitoring of one or several titrators from a PC.

Data logger. The PC stores all data referring to titrations, calibrations and measurements taken from each and every one of the connected instruments.

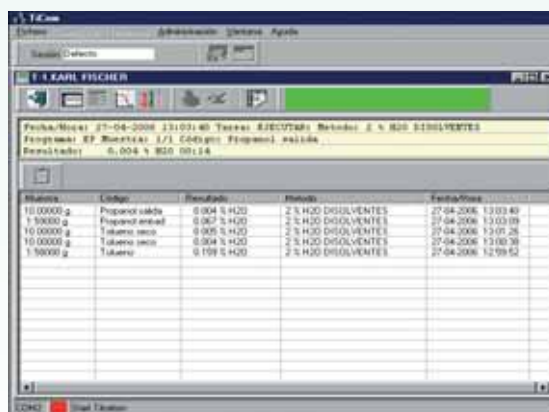
Capacity for different databases, thus allowing results to be classified. There is a filter to allow the display of data of interest to the user.

Data assignment from the PC: samples codes, weights and volumes.

Reports on one or several samples can be generated directly from the TiCom.

Exporting data to Excel or Access.

Dialogue boxes and instructions in Spanish and English.



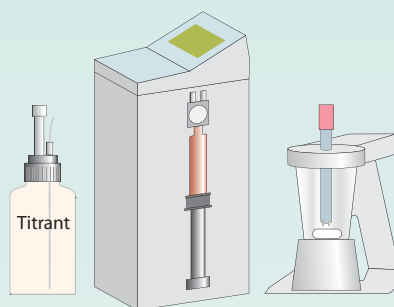
Example display, data received from a TitroMatic.

Instrument composition. Versions

TitroMatic KF 1S.

Assembly code: 86 70

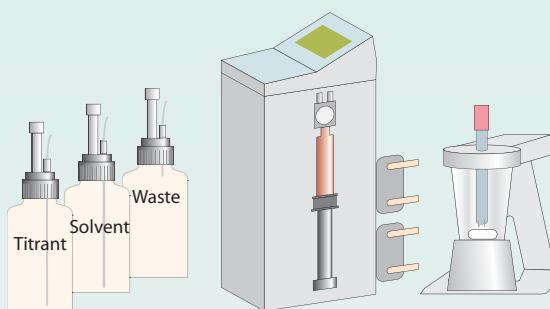
- TitroMatic with one 5 ml syringe.
- Reagent inlet and outlet tubes.
- Support for electrode with magnetic stirrer and titration vessel.
- Double platinum electrode 52 64 and electrode cable.
- Bottle cap set, DIN 45 screw. Bottle not included.



TitroMatic KF 1S 2B.

Assembly code: 86 71

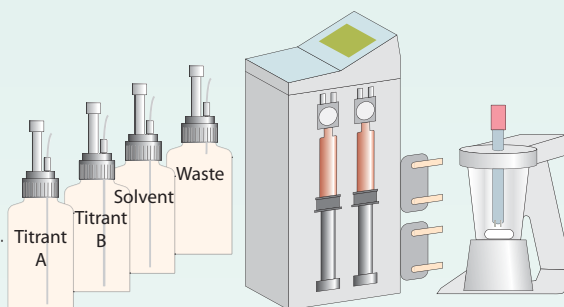
- TitroMatic with one 5 ml syringe and 2 peristaltic pumps.
- Reagent inlet and outlet tubes.
- Support for electrode with magnetic stirrer and titration vessel.
- Double platinum electrode 52 64 and electrode cable.
- 3 bottle cap set, DIN 45 screw. Bottles not included.



TitroMatic KF 2S 2B.

Assembly code: 86 72

- TitroMatic with two 5 ml syringe and 2 peristaltic pumps.
- Reagent inlet and outlet tubes.
- Support for electrode with magnetic stirrer and titration vessel.
- Double platinum electrode 52 64 and electrode cable.
- 4 bottle cap set, DIN 45 screw. Bottles not included.



! PLUG-IN POWER SUPPLY: The instruments is supplied with a 220 VCA adaptor. For 115 VCA specify when ordering.
CRISON does not supply Karl Fischer reagents.

Certificates

All TitroMatic KF are supplied with:

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

Upper view:
display and keypad.



Specifications

TitroMatic KF	
Non-volatile memory:	Up to 5 titration programs in the TitroMatic 1S. Up to 10 in the TitroMatic 2S. Burette auto-calibration program. Clock / calendar. Header texts: 2 lines x 40 characters. Name of up to 4 operators. Program comments: 8 lines x 40 characters. Up to 50 results stored in the Data Logger.
Languages	English, Spanish, French, Italian.
Display	Graphic backlit liquid crystal display, 128 x 64 dots.
Keypad	Membrane, 7 keys. Guaranteed for up to 6 million strokes per key. Material: PET with protective treatment.
Measuring ranges	From 0.1 mg up to 100 % of water.
Syringe volume	Standard 5 ml.
Resolution	1/40000 of the syringe volume.
Dispensing accuracy	(as relative error) $\leq 0.2\%$ for volumes higher than 10 % of the syringe.
Reproducibility of the dispensing	$\pm 0.1\%$ for volumes higher than 10 % of the syringe.
Materials in contact with the liquid	Syringe: borosilicate glass and PTFE. Electrovalve: PTFE and KEL-F. Tubes: PTFE.
Inputs and outputs	Polarised electrode, BNC connector. For external keyboard, miniDIN connector. RS 232 C bidirectional for PC or printer, telephone connector. RS 232 C, for balance, telephone connector. Stirrer control: On/Off and speed, RCA connector.
Power supply	220 / 24 VAC, 1.25 A, 30 VA external power supply.
Electrical safety	Meets EC, EN 61010.
EMC (Electromagnetic compatibility)	Meets EC, EN 50081-2 and EN 50082-2.
Permitted ambient conditions	Operating temperature, 10...40 °C. Storage temperature, -10...50 °C. $\leq 80\%$, relative humidity, non condensing.
Enclosure	ABS and enamelled steel.
Physical parameters	Weight: 4 kg approx. Dimensions: 130 x 160 x 300 mm.

Ordering information

Code	Description
86 70	TitroMatic KF 1S, Karl Fischer titrator with one 5 ml syringe, complete*.
86 71	TitroMatic KF 1S 2B, Karl Fischer titrator with one 5 ml syringe and two peristaltic pumps, complete*.
86 72	TitroMatic KF 1S 2B, Karl Fischer titrator with two 5 ml syringes and two peristaltic pumps, complete*.
82 01	Thermal printer CT-S280, 40 columns.
86 80	TiCom software "demo" kit, TitroMatic - PC, duration:100 days. Includes CD with software and cable.
86 81	License key for complete installation of TiCom software "demo" version.
86 82	TiCom software kit for communication between TitroMatic - PC. Includes CD with software and cable.

*See supplied accessories in "Instrument composition. Versions", page 5.

Authorised CRISON dealer:

Instruments developed and manufactured in Spain by:

CRISON INSTRUMENTS, S.A. • Tel. +34 935 409 320 • Fax +34 935 559 300 • E-Mail crison@crison.es • www.crison.es

The specifications and products of this brochure are subject to change without notice.

Other CRISON products



pH, redox and ion-selective electrodes.



Lab pH-meters and conductivity meters.



Automatic titrators.



pH, X, O.D. and °C portables.



Buffer and standard solutions (pH, X, O.D.)



Ask for the specific brochure of the products you are interested in.