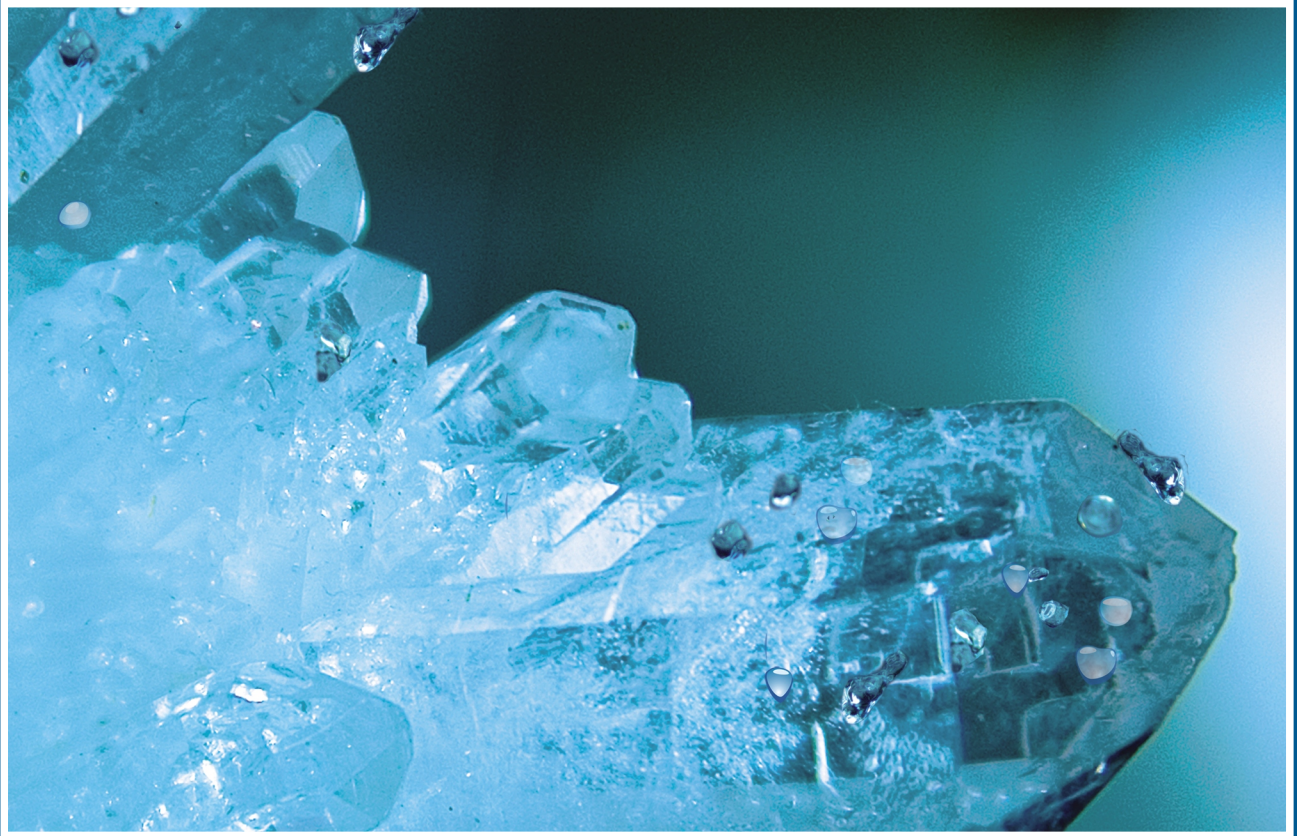


EXPERTS IN ANALYSIS



**aqua**  
40.00

Water determination in solids,  
liquids and gases

[www.ECH.de](http://www.ECH.de)

## Description

The Basic Module is the essential device for microcoulometric water determination according to Karl-Fischer-Titration in liquid samples and gases. This coulometric titration is based on the electrochemical generation of the iodine needed for the determination. There is no need for any working with titer of KF-reagent and their adjustment.

The optimized measuring cell allows very low background drift and short preconditioning times. Therefore the coulometric method can be used as a down to trace ppm-analysis. The sample to be analyzed is injected right into the measuring cell.

The titration current is adjusted automatically and continuously to the amount of water. Short measuring times are realized.

Measuring cells without diaphragm can be used. Many applications do not require a diaphragm, so only one coulometric reagent is needed. All customary KF-reagents are suitable.

The Basic Module can be upgraded with additional modules available on request.

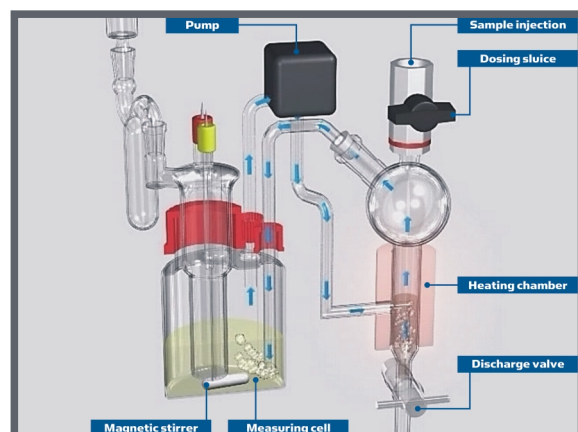
## Applications

Water determination according to Karl-Fischer-Titration in

- Solvents
- Lyophilisates
- Petrochemicals
- Biodiesel
- Hydraulic oils/Mineral oils
- Solids via liquid extraction



AQUA 40.00 Basic Module

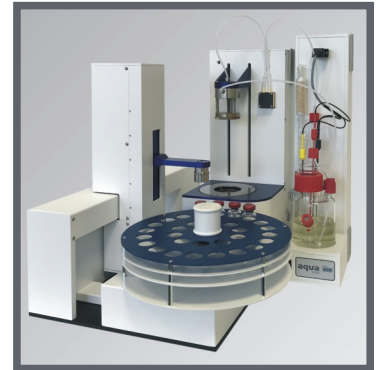


Closed-loop carrier gas circulation if coupled with extension module

## Extension modules

### Vario HeadSpace Module

- Universal module for all kind of samples: solids, pasty substances and oils
- Closed-loop gas circulation, no dried additional carrier gas is necessary
- For samples that change the water content if in contact with ambient air
- Heating procedure with definable temperature programs
- Analysis of closed sample vials for hygroscopic samples
- Suitable for 2 R - 50 R vials
- Automatic identification of sample rack



AQUA 40.00 with Vario Head Space Module

### Oil Module and Solid Module

- Gas extraction - the ideal method to handle oils, solids and pasty substances
- Heating procedure with definable temperature programs
- Closed-loop gas circulation, no dried additional carrier gas is necessary
- Heating module of oils is used for oil volumes up to 20 ml
- Heating module of solids is used for very small sample amounts (below 10 µg)



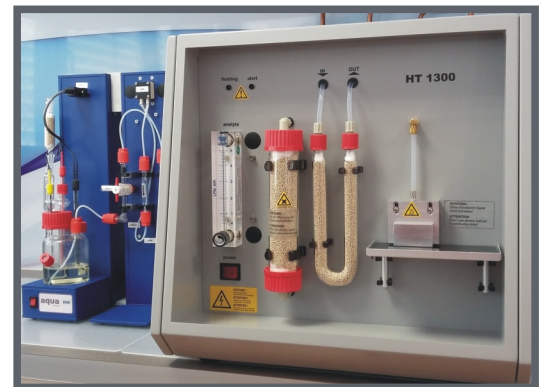
AQUA 40.00 with Oil Module



AQUA 40.00 with Solid Module

### High Temperature Oven Module

- This oven can heat out the sample at temperatures ranging up to 1300 °C
- A special valve system transports the sample into the oven without interrupting the carrier gas circulation
- Internal drying of carrier gas



High Temperature Oven Module

### LPG/LNG Module

- Designed for an easy and accurate determination of water in liquefied and gaseous samples such as LPG and LNG
- Suitable for all types of gases - flammable, inert as well as changing mixtures
- Determination of pressure in the sample loop, so no additional rinsing gas is needed
- Compact and portable device in combination with carrying case for on-site measurements



AQUA 40.00 with LPG/LNG Module



## Advantages

- Infinitely variable electrolysis current for very fast analysis
- Adjustment of titration rate to current amount of water to be titrated
- Low background drift
- All customary KF-reagents are suitable
- Easy-to-use software
- Defined methods for measurement
- Status display through large-scale colouration
- Additional heating modules can be used

## Specifications

|                                      |   |
|--------------------------------------|---|
| Measuring range:                     | 1 µg ... 100 mg, absolutely                                   |
| Resolution:                          | 0.1 µg  |
| Reproducibility:                     | ± 3 µg at 10 ... 1000 µg, 3 % at > 1 mg                       |
| Generator current:                   | infinitely variable from 0 up to 250 mA                       |
| Sample volume:                       | 0.01 ... 20 mL (direct injection)                             |
| Volume of reagent in measuring cell: | 100 mL  |
| Analysis duration:                   | 5 min (dependent on water content)                            |
| Results in:                          | µg, µg/L, mg/L, ppm, %, mC, customized with formula generator |
| Indication:                          | biamperometrical, polarisation with square-wave voltage       |
| Power supply:                        | 230 V/50 Hz; 115 V/60 Hz                                      |
| Interface:                           | RS 232  |
| Balance connection:                  | RS 232  |
| Dimensions:                          | 112 x 448 x 208 mm (W x H x D)                                |
| Weight:                              | 5 kg  |
| Device control:                      | PC software (PC not included in the scope of delivery)        |

## We are here for you



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 E-mail: info@ech.de  
 Website: www.ech.de

**Reagent consumption**

General | Electrolyte

Parameter:

Name: Hydranal-Coulomat AG

Charge: 5243C

Volume: 100.0 ml

Capacity: 10.0 mg/ml

Reagent consumption:

Completed meas.: 7

Duration: 105 days

Conversion: 30.417 mg

Buttons: OK, Cancel, Help

Reagent consumption

**Measurement method**

Method name: oil

Sample name: oil No. 1560

Weight: 1200.00 mg

Volume: 10.000 ml

Density: 1000.00 g/l

Blank value: 0.0 µg

Type of result: Water [ppm]

Measurement mode: Single measurement

Multi measurement: Number: 0

Buttons: OK, Cancel, Help

Measurement method for oil

**Protocol for titration test according to ISO 9001-9003**

General | Reagents | Test standard | Comment

Water standard: Hydranal-Water Standard 1.00

Water content: 0.998 µg/mg

Water standard charge: 81420

Buttons: OK, Cancel, Help

Preparation and protocol of the titration test

**Evaluation of titration test according to ISO 9001-9003**

| No. | Sample amount [mg] | Dosed quantity [µg] | Detect. quantity [µg] | Detect. Water [µg] |
|-----|--------------------|---------------------|-----------------------|--------------------|
| 1   | 453.85             | 459                 | 461                   | 1.003              |
| 2   | 425.45             | 425                 | 422                   | 0.991              |
| 3   | 505.20             | 504                 | 505                   | 1.000              |

Given set value: 0.998 µg/mg

Detect. actual value (mean): 0.999 µg/mg

Detect. reproducibility: Rel. standard tolerance: 0.53 %

Detect. accuracy: Rel. accuracy: 0.11 %

Test criterion met: Yes

Buttons: Close, Help

Evaluation of the titration test