Coulometer - Karl-Fischer Method - CKF 1 (automatic)

ASTM D 1533, ASTM D 4928, ASTM D 6304, ISO 10101-3, ISO 10337, ISO 12937, IP 386, IP 438, IEC 60814

Product group(s): Oil

User group(s): Biodiesel, Biofuel, Diesel, Engine Oil, Fuel, Gasoline, Gear Oil, Jet Lube, Solvent, Turbine Oil

Scope: This test method covers the determination of water in the range from 0.02 to 5 mass or volume % in crude oils.

Mercaptan (RSH) and sulfide (S- or H_2S) as sulfur are known to interfere with this test method, but at levels of less than 500 µg/g (ppm), the interference from these compounds is insignificant.

Background
The Cou-Lo Aquamax has been developed in response to many suggestions and comments from our customers in laboratories, off-shore and in the field. The built-in battery and optional carry case, provide the versatility required by the laboratory and also the ease of use and portability required by the field engineer.

Easy to Use
Simple to programme so that only a single button needs to be pressed for a titration, everything else is automatic. The unique Low Drift Cell glassware design is by far the easiest to use and also the most robust. The "O" ring system allows the joints to seal completely without the use of grease or Teflon sleeves. Hassle free assembly and disassembly.

- **ACE control system (patent pending)**
- **Display calculates ppm, mg / kg or % live during titration.**
- **Reagent Life**

Results & Records
The built-in high speed printer provides hard copy of results and even allows duplicate print outs if required. Results can also be downloaded via the Results Manger software package onto a PC spreadsheet format.

Spares & Accessories
The Cou-lo Aquamax is supplied ready for operation. A comprehensive glassware pack including electrodes, vessel, leads, syringe, printer paper, etc. is supplied as standard. A calibration certificate and 24 month warranty are also provided.

Reagents
Cou-Lo Formula "A" anode reagent is suitable for most routine applications and is especially useful for water content determination of oil samples, e.g. transformer oils, crude oils, etc. The anode reagent is supplied in "single shot" bottles of 100 ml, no volume measurement or mixing with other solvents is required. Cathode reagent, Formula "C", is supplied in "single shot" 5 ml ampoules which have "safety snappers" pre-fi tted thereby reducing risk to the operator.

Coulometric Teat Equipment acc. Karl-Fischer
More details are mentioned in the "Order Number" section

Note! ASTM D 4928 is a volumetric method

Technical Data

Control:	Multilevel stepped current with ACE control system, microprocessor controlled
End Point Detection:	AC Polarization
Titration Speed (max):	2.0 mg / minute
Measuring Range:	1 µg - 100 mg Water (concentrations from 1 ppm - 100% water)
Sensitivity:	0.1 µg water
Precision:	+/- 3 µg (10 µg - 100 µg) / +/- 5 µg (100 µg - 1 mg) / +/- 0.5 % above 1 mg
Drift Compensation:	automatically controlled
Cell Type:	Low Drift Cell
Statistics:	Min, Max, Mean values up to 99 runs
Method storage:	10 user programmable methods
Interfaces:	RS232, USB
Results Format:	ppm / µg / % ,(mg/kg for IEC)
Reagents:	All commercially available coulometric reagents, either two component or single reagent type
Safety (CE Conformity):	TUV 01/2002, EN 61 326 etc.
Dimensions (W x D x H):	25 x 24.5 x 12 cm
Weight:	3.5 kg
Voltage:	90 - 264 V, 47 - 63 Hz, 12 V DC + battery

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Main Unit

16-1880 **Coulometer acc. Karl Fischer - CKF 1**

ASTM D 1533 - ASTM D 4928 - ASTM D 6304 - IP 386 - IP 438 -
ISO 10 101-3 - ISO 10 337 - ISO 12 937 - IEC 60 814

Easy to use, simple to programme so that only a single button needs to be pressed for a titration, everything else is automatic. Specially designed for outdoor use and portability. Built with 40 character backlid LCD , 15 key touchpad, 42 character high speed thermal printer, calendar & clock for analysis time & date print out, battery low indicator, data storage possibility on removable flash drive (memory stick)

Consisting of:
1 **Low Drift Cell Assembly** (titration vessel with 2 injection ports, a generator & detector electrode port and a drying tube port)
1 **Generator Electrode** (combined electrolysis cell)
1 **Detector Electrode** (dual platinum, AC polarization current / resistance measurement)
1 **Drying Tube** (contains molecular sieve to stop atmospheric moisture from contaminating cell and electrodes, cap and 100 ml desiccant)
1 **Glass Syringe** (1 ml) with **Luer Needle**, 10 **Injection Septa**, 1 **Stirrer Bar**, 2 **Thermal Paper Rolls**

Supplied with:
Results Manager Software Package, battery pack, power adapter, car adapter and mains lead.

Power supply: 90-264 V, 47-63 Hz, 12 V DC+ battery

Options & Accessories

16-1859 **Water Standard, 10 ampoules each 8 ml, 0.01 %**

16-1858 **Water Standard, 10 ampoules each 8 ml, 0.10 %**

16-1864 **Reagent Hydranal-Coulomat A, 500 ml (anode reagent)**

16-1884 **Cou-Lo Reagent Kit (Formula A+C) for oil analysis**

Consisting of:
8 x anode reagent (Formula A), 100 ml, single-shot screw top bottles
8 x cathode reagent (Formula C), 5 ml, easy-snap ampoules

16-1881 **Carry case with internal storage compartment**

16-1891 **Moisture Evaporator**

ASTM D 6304 - ISO 10336 - IP 356 - JIS K2275

In combination with the **Coulometer acc. Karl Fischer (CKF 1)**
for water content determination of heavy oils, greases and lube oils which contain additives that interfere with the Karl Fischer reagents.

- Digital temperature control
- Rotameter carrier gas flow control
- Built-in carrier gas drying system
- Operating temperature ambient up to 200°C
- Heated transfer tube
- Overheating protection
- Automatic cell evacuation system

Temperature Range: ambient to +200 °C
Heating method: cartridge base heater
Ambient conditions: 5 - 35°C, less than 85% RH
Dimensions (WxDxH): 320 x 210 x 330 mm, Weight approx. 6 kg

Power supply: 200-240, 50/60Hz, 400 W

Spare Parts

16-1885 **Detector Elektrode with connector**

16-1886 **Generator Electrode (with frit)**

16-1887 **Paper for thermal printer, 1 roll**

16-1888 **Titration Vessel, twin port**

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16-1889	**Injection Septa (pack of 10)**
16-1892	**Syringe with Luer lock needle, 1 ml, glass**

Order Guideline

Minimum equipment: 1x 16-1880
Spares (approx. 1 year): Reagent & Water standards
Additional requirements:

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