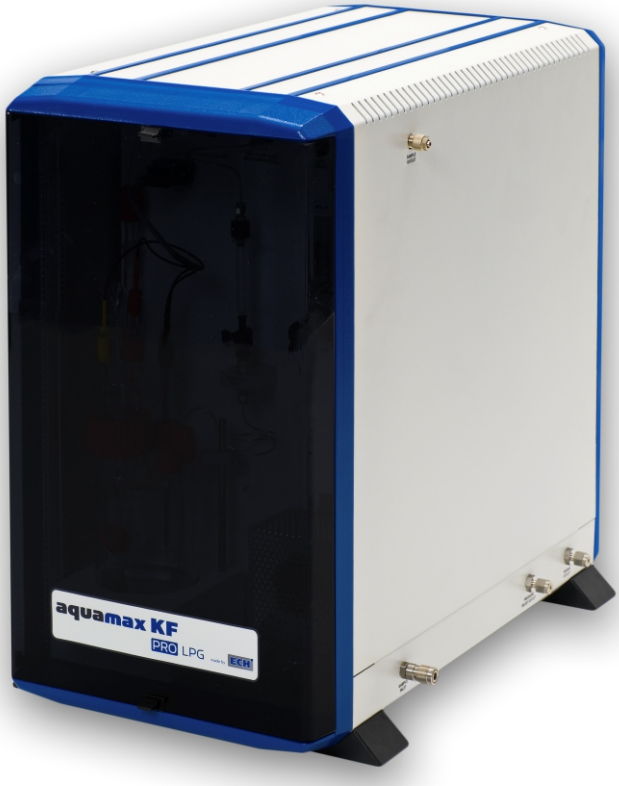
Water determination in gases and LPG

Conform to standard ASTM D 7995



aquamax KF PRO LPG

made by ECH

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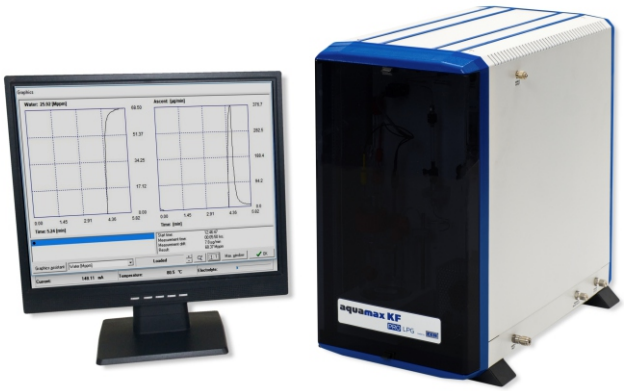
Product description

The Aquamax KF PRO LPG is designed for an easy and accurate determination of water in liquefied and gaseous samples such as LPG and LNG. The device combines coulometric Karl Fischer method with an automatic gas evaporation and dosing procedure.
The Aquamax KF PRO LPG includes all features required for ppm level water in LPG and Gas, including the sulphur removal cartridge eliminating the side reactions caused by sulphides/H_2S. Our sample loop principle allows you to fully automate the measurements, up to 125 per day!
All Aquamax KF PRO LPG parts are totally enclosed making this system completely safe and robust for use in the demanding petroleum industry.
The unique ECH sample loop allows you to use the instrument in your laboratory with full automation, as a portable/field use analyzer or can be integrated in to your process as an on-line system.



The Aquamax KF PRO LPG fulfils the requirements of the standard ASTM D 7995 - 19: Standard Test Method for Total Water in Liquid Butane by Liquefied Gas Sampler and Coulometric Karl Fischer Titration.

Applications

LPG, LNG:

- Propane, propene, butane, butene, butadiene
- Ethylene oxide
- Chlorinated hydrocarbons, e. g. methylene chloride, ethylene chloride, vinyl chloride

Refrigerants:

- Halogenated hydrocarbons

Permanent gases:

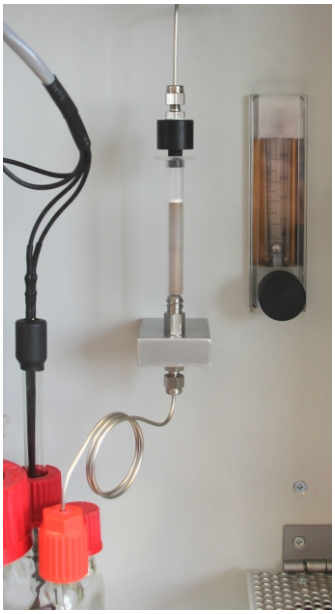
- Natural gas
- Technical gases
- Test gas mixtures

Advantages

- Sulphur removal cartridge eliminating the side reactions caused by sulphides/H_2S
- No interference calculation required
- Totally automated process, no operator input in the software required for the test
- 250 measurements can be performed in 48 hours
- Suitable to test all gas types without any calibration or adjustments
- No balance is required
- No separate rinsing gas is required
- Rinsing process is fully automated
- High sample throughput and long reagent life
- Compact device
- Can also be used for the measurement of liquid samples by direct injection into the titration cell

Features and Results

- Determination of moisture in liquefied and gaseous samples
- Inlet pressure up to 200 bar/2900 psi
- Determination of pressure in the sample loop
- Freely adjustable sample volume
- Automatic pressure regulation
- Transfer line with direct injection
- Automatic rinsing bypass and steps for rinsing
- Measuring cell without diaphragm (only one electrolyte required)
- Setting of application-specific methods
- Sulphur trap eliminating the side reactions caused by sulphides/H_2S
- Type of result: µg, ppm (gas volume), Vppm, Mppm, Mol ppm related to various standard reference conditions
- Formula generator available



Sulphur trap for elimination of H_2S and mercaptans

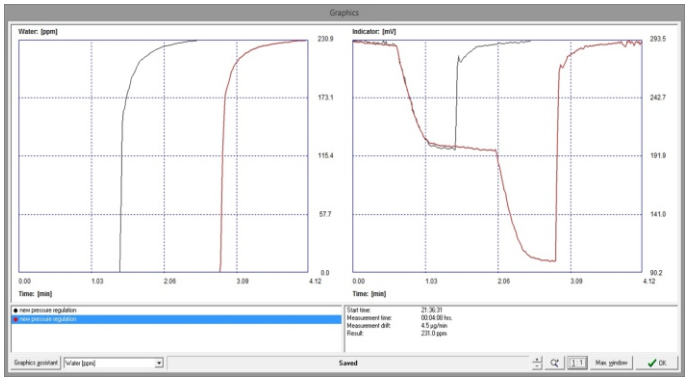
Example of a measurement series with sulphur trap for propane with ethyl mercaptan as odorisation

Result overview:

Measurement	Sample amount	Result
1	539.282 mL	48.30 Mppm
2	539.067 mL	47.98 Mppm
3	539.282 mL	47.95 Mppm
4	538.563 mL	47.54 Mppm
5	538.555 mL	47.33 Mppm
6	538.141 mL	45.79 Mppm
7	536.514 mL	46.72 Mppm

Statistics:

Arithmetical mean:	47.37	Mppm
Standard deviation:	0.87	Mppm
Rel. standard deviation:	1.83	%



Example for multi-injection of the sample:
one-step and two-step dosing process in comparison

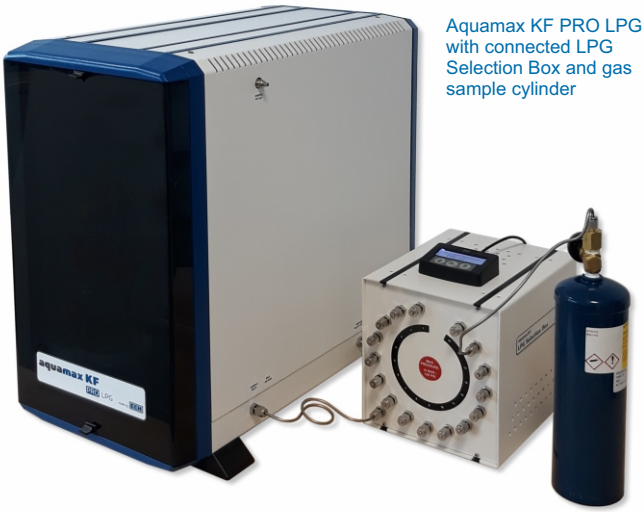
Method Conformity

The coulometric Karl Fischer titrator Aquamax KF PRO LPG can be used for the following standard methods (examples):

ASTM	D 1364	Volatile solvents
ASTM	D 1533	Insulating liquids
ASTM	D 3401	Halogenated organic solvents
ASTM	D 4928	Crude oils
ASTM	D 6304	Petroleum products
ASTM	D 7995	Total Water in Liquid Butane
ASTM	E 1064	Organic liquids
API	Ch. 10.9	Crude oil
DIN	51777	Petroleum products
DIN EN ISO	12937	Petroleum products
EI / IP	386	Crude petroleum
EI / IP	438	Petroleum products
IEC	60814	Insulating liquids
ISO	TC 158/SC	Natural gas and gas substitutes
ISO	10101-1	Natural gas
ISO	10101-3	Natural gas
ISO	10337	Crude petroleum

Accessories

The **LPG Selection Box** is an expansion module for your Aquamax KF PRO LPG. This completely automates the sample feed to the device. This means that up to 15 gas cylinders can
be analysed fully automatically and contamination-free, including appropriate rinsing steps.



Aquamax KF PRO LPG with connected LPG Selection Box and gas sample cylinder

The **SWOP BOX** makes it easy and convenient to change reagents in titration cells. The module can be used on any Karl Fischer titrator, regard-less of the system/design. The direct contact with chemicals and the ingress of humidity are minimised.

Universal reagent exchange module SWOP Box

Technical specifications

Measurement method:	Coulometric Karl Fischer titration
Sample:	Pressurized gas sample (LNG, LPG, gas)
Sample dosing:	Pressurized bottle or directly from the gas line
Pressure reducer:	Internal (with heating element)
Sample loop:	300 mL (gas)
Rinsing and dosing:	0 … 15 steps for each, adjustable
Measuring range:	1 ppm ... 10 %
Resolution:	0.1 ppm
Detection limit:	1 ppm
Typical measuring time:	5 ... 15 min
Power supply:	230 V/50 Hz; 115 V/60 Hz
Dimensions:	33 x 49 x 48 cm (W x D x H)
Weight:	24 kg
Device control:	PC software (PC not included in the scope of delivery)

Example of a 5 L Propane Cylinder

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