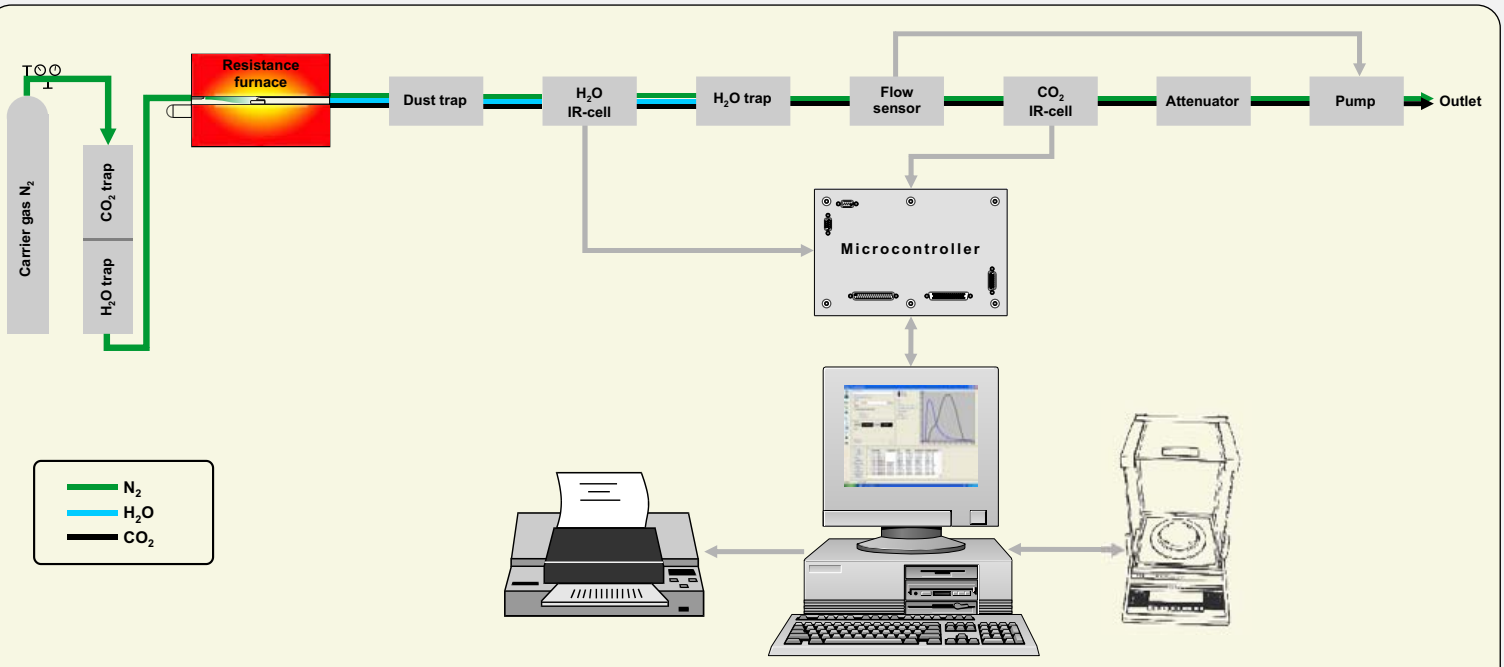
CW - 800
CO_2 / Water Determinator

ELTRA
Analysers made in Germany

- PC controlled
- Dual range infrared cell
- No halogen trap required
- No influence of the water on the CO_2 result
- Electronic gas flow control
- Furnace temperature up to 1000°C

TÜV CERT
DIN EN ISO 9001
Certificate: 01 100 0020005

CW-800 Simultaneous CO_2 and Moisture Determinator



Description

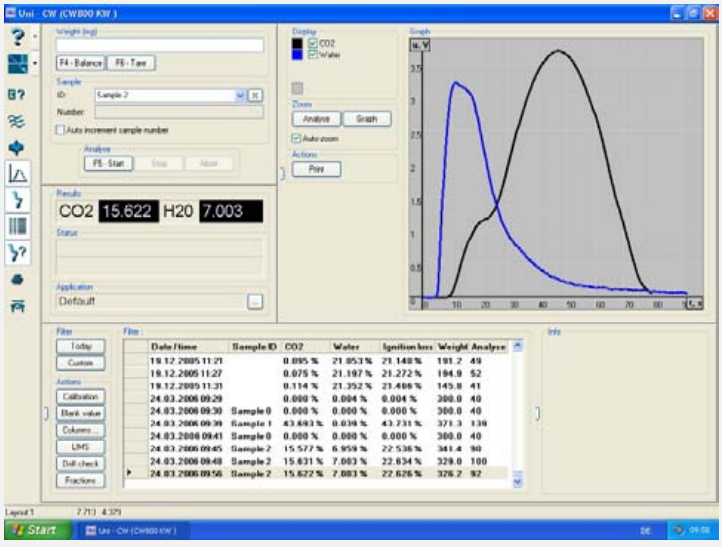
The CW-800 incorporates the latest technology. It is designed for the rapid simultaneous determination of CO_2 and H_2O in materials such as lime, cement, gypsum, ores, minerals, etc.
The CW-800 is equipped with two independent infrared cells. The sensitivity of these cells can be customized to meet specific requirements. The IR-absorption lengths can be individually selected to offer optimum precision for the analysis of high and low levels of both, CO_2 and H_2O.
The CW-800 features a microcontroller, a high temperature resistance furnace up to 1000°C and solid state infrared detectors with auto zero and auto range control.

Analysis procedure

The sample is weighed into a combustion boat on an electronic balance which is interfaced to the PC. By pushing a key the sample weight is transferred into the PC. If required, the sample weight can also be entered manually. The start key is pressed and the analysis cycle begins. The boat with the sample is then placed on the holder of the sample loading mechanism and entered into the furnace. The signals of the CO_2 and H_2O detectors can be observed on the PC-screen during analysis. At the end of the cycle, the analysis results appear on the screen and the analysis data is stored on the hard drive.

PC control with Windows 2000/XP software

Comprehensive analyser control and easy operation are provided by the PC and software connected to the computer.



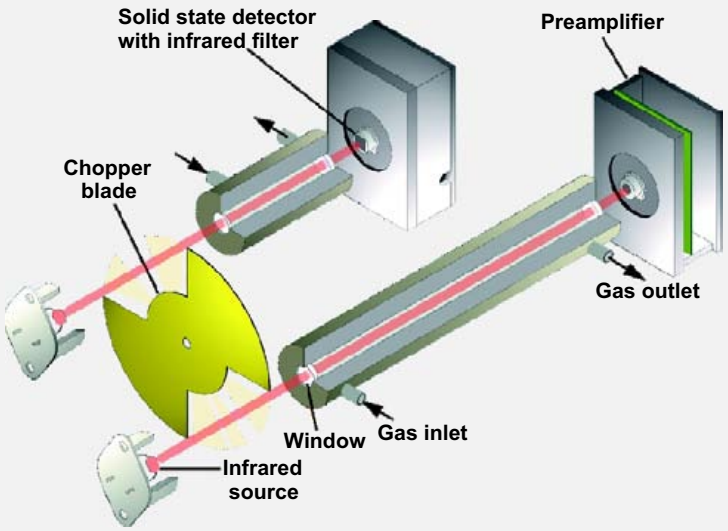
The multilingual software provides the user with the following features:

- Optional display layout - adjustable screen appearance of the program windows.
- User profiles with multi-level access - parameter changes protected by unauthorized acces.
- Sample ID memory - supplemented with running analysis number.
- Data base (analysis results storage) - all data for each analysis is stored and can be recalled later for review, report creation, statistical calculations or results recalculation with modified parameters.
- Optional data base configuration - displays only results meeting specified conditions, for example, certain date/time period, specific sample I.D. etc.
- Visualisation of the results consistency.
- Peak separation calculation procedure for fractional analysis.
- LIMS communication and data export (Notepad, Excel etc.).
- Basic one-point and advanced multi-point calibration.
- Barometric pressure compensation.
- Simultaneous calibration of more than one measuring range.
- Procedure for automatic linearity correction calculation.
- Applications memory and deficiency checks - adjustable analysis counters to prompt the changing of reagents, cleaning of filters and other maintenance procedures.
- Hardware diagnostics display and technical report printouts.

CW-800 Simultaneous CO_2 and Moisture Determinator

Infrared cells

The infrared cells of the CW-800 do not require any manual zero adjustments. The zero and sensitivity adjustments of the infrared cells are permanently and automatically controlled by the electronics. The detectors utilize solid state sensors combined with infrared filters. The sensors are not gas filled, thus eliminating long term problems due to gas leakage. The CW-800 is equipped with two independent infrared cells for CO_2 and H_2O determination.



The lengths of the cells can be individually optimized, to obtain maximum precision for the target analysis levels of each customer. Each of the cells can be installed with infrared absorption lengths ranging between 1 mm and 320 mm.

CO_2 result unaffected by the water content

The gases coming from the furnace pass through the water cell first and then through a moisture absorber. The dried water-free gases then pass through the CO_2 cell. As there is no moisture present in the CO_2 cell there cannot be any influence from the water present in the sample.

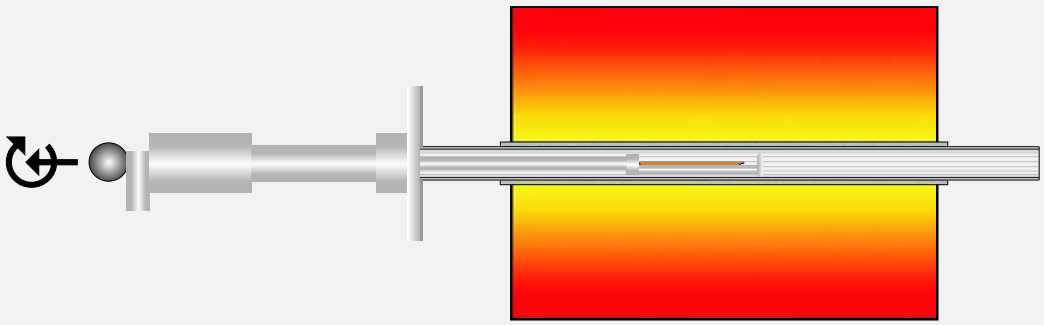
Electronic flow controller

An essential part of the gas flow system is the electronic flow controller. This provides a stable gas flow by eliminating the known disadvantages of mechanical controllers.

Resistance furnace up to 1000°C

The resistance furnace employs resistance wire as a heating element. Full electronic control includes current limitation during cold-start conditions to promote long element life. A separate sensor is used to monitor ambient temperature and provide data for automatic reference point compensation ensuring that furnace temperature is not affected by fluctuations of ambient temperature. The furnace requires approximately 20 to 25 minutes to reach operating temperature.

The CW-800 is supplied with a combustion boat insertion mechanism. The boat is placed on the tray of the mechanism. At the start of the analysis the tray is mechanically pushed into the hot zone of the furnace. On the completion of the analysis the tray is mechanically removed and rotated through 180° to remove the hot boat.



Typical results

Cement

22.02.06 13:46	Cement/001	395.3 mg	6.6218 %CO_2 1/0	0.5037 %H_2O 2/0
22.02.06 13:49	Cement/002	396.4 mg	6.6478 %CO_2 1/0	0.4914 %H_2O 2/0
22.02.06 13:51	Cement/003	404.8 mg	6.6185 %CO_2 1/0	0.4924 %H_2O 2/0

average in the range CO_2 : 6.62937 — average in the range H_2O : 0.49583
standard deviation : 0.01605 / 0.24 % — standard deviation : 0.00683 / 1.38 %

Raw meal

22.02.06 13:55	Raw meal/001	247.1 mg	34.922 %CO_2 1/0	1.3437 %H_2O 2/0
22.02.06 13:58	Raw meal/002	225.6 mg	34.906 %CO_2 1/0	1.3355 %H_2O 2/0
22.02.06 14:01	Raw meal/003	261.3 mg	34.825 %CO_2 1/0	1.3063 %H_2O 2/0

average in the range CO_2 : 34.88433 — average in the range H_2O : 1.32850
standard deviation : 0.05200 / 0.15 % — standard deviation : 0.01966 / 1.48 %

Artex

22.02.06 14:04	Artex/001	267.6 mg	3.7783 %CO_2 1/0	4.5358 %H_2O 2/0
22.02.06 14:06	Artex/002	247.1 mg	3.8090 %CO_2 1/0	4.5053 %H_2O 2/0
22.02.06 14:09	Artex/003	264.9 mg	3.8555 %CO_2 1/0	4.5650 %H_2O 2/0

average in the range CO_2 : 3.81427 — average in the range H_2O : 4.53537
standard deviation : 0.03887 / 1.02 % — standard deviation : 0.02985 / 0.66 %

Plaster

22.02.06 14:12	Plaster/001	242.7 mg	3.7091 %CO_2 1/0	2.7981 %H_2O 2/0
22.02.06 14:13	Plaster/002	274.7 mg	3.7620 %CO_2 1/0	2.7537 %H_2O 2/0
22.02.06 14:15	Plaster/003	256.2 mg	4.0480 %CO_2 1/0	2.7332 %H_2O 2/0

average in the range CO_2 : 3.83970 — average in the range H_2O : 2.76167
standard deviation : 0.18232 / 4.75 % — standard deviation : 0.03318 / 1.20 %

CW-800 Specifications

MEASURING RANGES

CO_2	H_2O
Up to 400mg CO_2 [1]	Up to 300mg H_2O [1]
Indicating range Up to 100% CO_2 [2]	Indicating range Up to 100% H_2O [2]

SENSITIVITY

CO_2	H_2O
0.0001% CO_2	0.0001% H_2O

ACCURACY

CO_2	H_2O
± 0.02% CO_2 or ± 1% of CO_2 present [1]	± 0.02% H_2O or ± 1% of H_2O present [1]

GENERAL SPECIFICATIONS

Detection method Solid state infrared absorption for CO_2 and H_2O	Normal sample weight 200 mg
Furnace temperature Adjustable up to 1000 °C	Normal analysis time 2 to 3 minutes
Interfaces serial and USB [4]	Gas required Nitrogen 2 to 4 bar (30 to 60 psi) 3 l/min
Power requirements 230 V AC ±10% 50/60 Hz 10 A / 2.3 kW	Chemicals CO_2 trap - sodium hydroxide H_2O trap - magnesium perchlorate
Weight analyser: approx. 65 kg	Dimensions [3] Width Height Depth 55cm (21") 80cm (31.5") 60cm (23.5")

ACCESSORIES

Balance: 0.0001g to 60 g ±0.0001 g [5]

Computer: PC with HDD, 3.5" drive, CD-ROM, TFT flat screen and keyboard [5]

Color printer with automatic cut sheet feed, other options on request [5]

1) Depending on the material. 2) Possible by reducing the sample weight.
3) Allow 15 cm (6") access area behind the analyser. 4) Balance (serial - RS232) and printer USB are connected to the PC.
5) Visit our web site for further details (http://www.eltragmbh.com/cw800/information.shtml).

ELTRA

ELTRA GmbH
Mainstr. 85 Block 20
D-41469 Neuss
Germany
☎ +(49) 2137 12822
Fax: +(49) 2137 12513
analysers@eltragmbh.com
www.eltragmbh.com

05.10.2006