

CS - 800 Double Dual Range

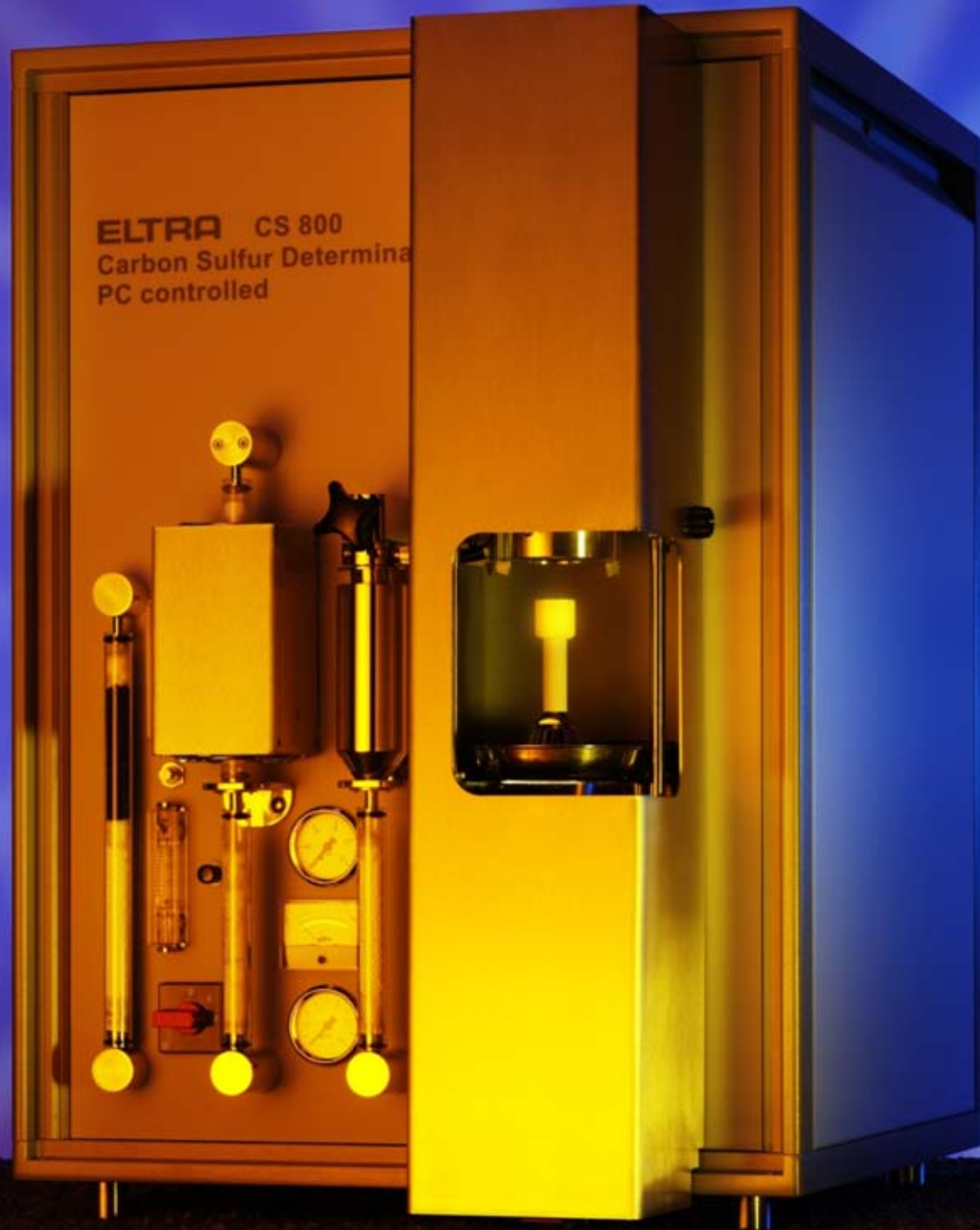
Carbon / Sulfur
Determinator

[Click here to see
CS-800 with robotloader](#)

[Click here to see
CS-800 with auto sampler](#)

ELTRA

Analysers made in Germany

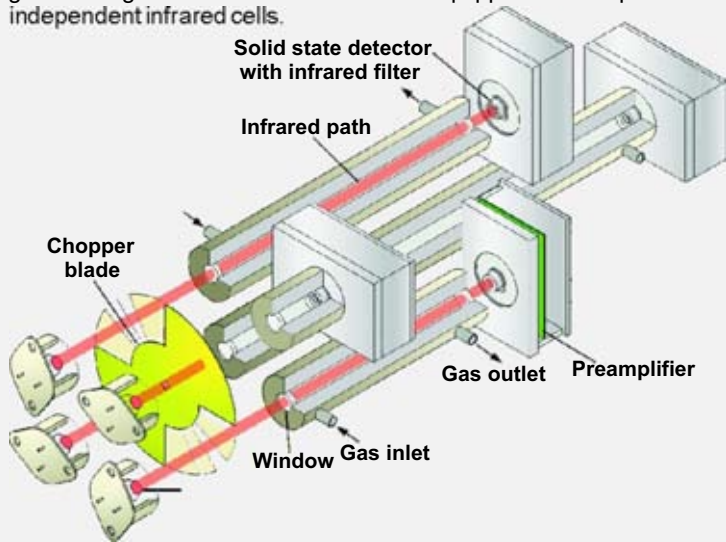


- Four solid state infrared cells
- No halogen trap required
- Automatic furnace cleaning
- Power controlled induction furnace
- PC controlled
- Up to 20 grams of copper samples without accelerators



Infrared cells

The infrared cells of the CS-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 CS-800 can be equipped with up to four independent infrared cells.



The lengths of all four 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 1mm and 320mm.

Preheating crucibles

The ceramic crucibles for the induction furnace can be preheated in the high temperature furnace HTF-540. The preheating reduces the blank value of the crucibles. This is important for analysis in the very low ppm range.

The crucibles are inserted into the furnace tube and they remain preheated in the tube until needed. Each time a crucible is needed, a new one is inserted into the tube, and a preheated crucible falls out the other end of the furnace tube. The recommended preheating temperature is between 1250°C and 1350°C.

Auto loader

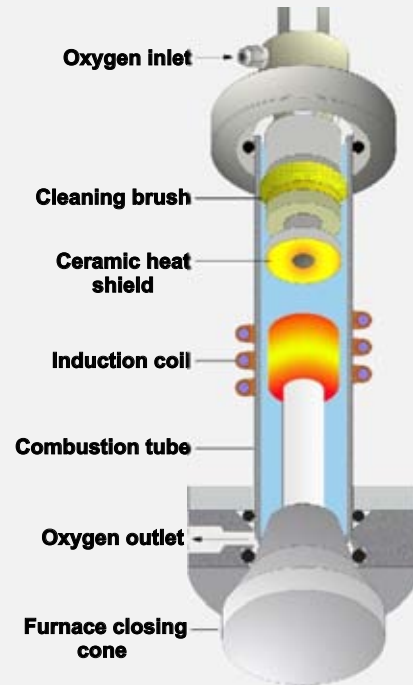
The CS-800 can be supplied with an automatic sample loading system. This loading system may also be retrofitted at a later date. Unlike many other auto loaders the ELTRA system can accommodate 130 samples giving hours of unattended operation. On request, the loader can be delivered for more crucibles. The auto loader, which does not occupy any additional bench space, is mounted above the area where the balance, PC, monitor and consumables are normally situated. The crucibles positions in the loader are easily accessible to the operator even from a sitting position. Three available models for 130, 104 and 36 crucibles. Dispensers for accelerators are available.

Depending on the application's, up to two dispensers can be attached to the analyser, for example one for tungsten and one for iron accelerator. The dispensers are controlled by the loader software.



Automatic induction furnace cleaning

Users of carbon and sulfur analysers with induction furnaces know that dust accumulates during combustion and forms deposits (mainly of iron and tungsten oxides) in the combustion chamber. The CS-800 furnace is cleaned automatically after each analysis, thus ensuring repeatable and accurate results without the time consuming and unpleasant task of manual furnace cleaning.



The standard cleaning apparatus is mechanically attached to the furnace open / close system, thus ensuring that it is not possible for the cleaning brush to collide with a hot crucible.

The cleaning brushes won't burn !

The efficient design of the cleaning mechanism rules out any possibility of the cleaning brush catching fire. To confirm this fact, ELTRA offers free replacement of each burned cleaning brush, during the entire working life of the analyser.

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.

Up to 20 grams of copper sample without accelerators

The unique design of the induction furnace combined with intelligent power control electronics enables the analysis of copper samples up to a weight of 20 grams without the need of any accelerators. This is very important in case of samples with extremely low C and S contents, like copper and copper alloys. The higher the weight, the higher the amount of C and S present. The elimination of the need for an accelerator is a breakthrough in the analysis of very low C and S. The use of accelerators can badly affect the results when the very low C and S in the sample is similar to the C and S content of the accelerators (blanks). The CS-800 eliminates this problem.

Carrier gas conservation

If an analysis has not been carried out for a period of time, the analyser will automatically switch to "gas conservation mode." This effectively means that the carrier gas flow rate is reduced to a minimum, only allowing a small amount of oxygen to circulate through the IR cells etc. The period of time before the gas conservation is activated, can be modified via the PC software. It is also possible to have carrier gas flow only during combustion. As soon as the next sample is analysed, the carrier gas returns to normal flow rate.



The induction furnace and the auto loader use standard ceramic crucibles, which are 1" or 25mm in diameter.

CS-800 Specifications

MEASURING RANGES

Low carbon
Up to 0.1% C at 500mg sample resp. up to 0.5mg C ¹⁾

Low sulfur
Up to 0.3% S at 500mg sample resp. up to 1.5mg S ¹⁾

High carbon
Up to 5% C at 500mg sample resp. up to 25mg C ¹⁾
Indicating range up to 100% C ²⁾

High sulfur
30% S at 150mg sample resp. up to 45mg S ¹⁾
Indicating range up to 100% S ²⁾

SENSITIVITY

Carbon
0.1ppm C at 500mg sample resp. 0.05µg C

Sulfur
0.1ppm S at 500mg sample resp. 0.05µg S ¹⁾

ACCURACY

Low carbon ¹⁾
±1ppm C ³⁾ at 1gram sample resp. ±1 µg C or ±0.5% of carbon present

Low sulfur ¹⁾
±1ppm S at 1gram sample resp. ±1µg S or ±0.5% of sulfur present

High carbon ¹⁾
±10ppm C ³⁾ at 500mg sample resp. ±5µg C or ±0.5% of C present

High sulfur ¹⁾
±10ppm S at 150mg sample resp. ±1.5µg S or ±0.5% of S present

GENERAL SPECIFICATIONS

Normal sample weight:
0.5g to 1g for steel and cast iron

Normal analysis time
40 to 50 seconds

Furnace type
Induction, 19.5 MHz 2.2 kVA max

Furnace dust cleaning
Automatic

Detection method
Solid state infrared absorption
for carbon and sulfur

Chemicals
CO₂ trap sodium hydroxide
H₂O trap magnesium perchlorate
Catalyst copper oxide

Gas required
Oxygen 99.5% pure 2 to 4 bar (30 to 60 psi) 3 l/min

Compressed air
4 to 6 bar (60 to 90 psi)

Interfaces
serial and USB ⁴⁾

Power requirements
230 V AC ±10% 50/60 Hz max 15 Amps 3450 Watts

Weight
analyser: approx. 110 kg

Dimensions Width Height Depth
55 cm (21") 80 cm (31.5") 60 cm (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) Other ranges on request. 2) Possible by reducing the sample weight. 3) With preheated crucibles and oxygen purification furnace. 4) Balance (serial - RS232) and printer USB are connected to the PC. 5) Visit our web pages for further details (<http://www.eltragmbh.com/cs800/information.shtml>).

Typical results

Steel

30.03.06 13:05	Steel/008	530.2 mg	0.0233 %C	1/0 93.7 ppmS	3/0 050
30.03.06 13:06	Steel/009	528.5 mg	0.0236 %C	1/0 94.2 ppmS	3/0 050
30.03.06 13:08	Steel/010	537.7 mg	0.0235 %C	1/0 92.6 ppmS	3/0 050
	means:	0.02346	93.5		
	sd:	0.000113	0.6		

Cast iron

28.02.06 15:00	Cast iron 38/013	502.0 mg	2.7843 %C	2/0 0.1536 %S	3/0 050
28.02.06 15:01	Cast iron 38/014	503.0 mg	2.7843 %C	2/0 0.1546 %S	3/0 050
28.02.06 15:03	Cast iron 38/015	506.5 mg	2.7947 %C	2/0 0.1535 %S	3/0 050
	means:	2.78776	0.1539		
	sd:	0.00577	0.0014		

Copper

28.02.06 14:44	Copper/031	5012.7 mg	52.1 ppm	1/0 4.3 ppm S	3/1 045
28.02.06 14:49	Copper/032	5132.5 mg	54.7 ppm	1/0 4.2 ppm S	3/1 047
28.02.06 14:53	Copper/033	4983.1 mg	56.3 ppm	1/0 4.3 ppm S	3/1 046
	means:	54.4	4.3		
	sd:	1.7	0.0		

Ore

31.03.06 09:52	Ore 25C/026	87.6 mg	1.0146 %C	1/0 5.3059 %S	2/0 041
31.03.06 09:55	Ore 25C/027	85.9 mg	1.0147 %C	1/0 5.1395 %S	2/0 041
31.03.06 09:57	Ore 25C/028	81.5 mg	1.0264 %C	1/0 5.3230 %S	2/0 039
	means:	1.01856	5.25613		
	sd:	0.00522	0.07775		

Cement

31.03.06 09:43	Cement B8/023	183.7 mg	1.0629 %C	1/0 0.5446 %S	2/0 050
31.03.06 09:46	Cement B8/024	181.6 mg	1.0366 %C	1/0 0.5463 %S	2/0 050
31.03.06 09:49	Cement B8/025	181.8 mg	1.0730 %C	1/0 0.5746 %S	2/0 047
	means:	1.0575	0.55516		
	sd:	0.0139	0.01295		

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The contents of the catalogue are subject to change without prior notice for further improvement.

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