

ELEMENTRAC[®] CS-d

GENERAL SPECIFICATION SHEET

ELEMENTRAC CS-d SERIES 4 CELL CONFIGURATION

CS-d 88200-1233



PARAMETER	INDUCTION FURNACE	RESISTANCE FURNACE
Working range C^{*1}	0.0012 – 70 mg (1.2 ppm – 7% for 1000 mg sample)	0.014 – 220 mg (40 ppm – 62.8% for 350 mg sample)
Working range S^{*1}	0.0006 – 30 mg (0.6 ppm – 3% for 1000 mg sample)	0.0022 – 110 mg (6.3 ppm – 31.4% for 350 mg sample)
Precision^{*2}	0.0004 mg C = 0.4 ppm C (1000 mg sample weight) 0.0002 mg S = 0.2 ppm S (1000 mg sample weight) or 0.5% whichever is greater	0.007 mg C = 20 ppm C (350 mg sample weight) 0.0011 mg S = 3 ppm S (350 mg sample weight) or 1% whichever is greater
Nominal weight	1000 mg	350 mg
Analysis time (nominell)	40 sec	60-120 sec
Measuring method	Inductive combustion in quartz tube in an oxygen stream followed by infrared detection	Combustion in ceramic tube in an oxygen stream followed by infrared detection
Chemical Reagents	- Magnesium perchlorate - Sodium hydroxide - Platinized Silica - Copper oxide (Alternative to Platinized Silica)	- Magnesium perchlorate
Required Gases	Oxygen, 99.5% purity 2 – 4 bar (30 – 60 psi) compressed air 4 – 6 bar (60 – 90 psi)	Oxygen, 99.5% purity 2 – 4 bar (30 – 60 psi)
Furnace	Induction furnace : 2.2 KVA rampable 0-100% adjustable 0-100%	Resistance furnace 600°C - 1550°C ; +/- 10°C of setpoint
Operating temperature	5°C – 40°C; Rel. Humidity 20 – 80% not condensing	5°C – 40°C; Rel. Humidity 20 – 80% not condensing
Operating humidity	< 80% ; not condensing at 31°C	< 80% ; not condensing at 31°C
Maximum operation Height	2000 meter	2000 meter
Dimensions (W x H x D)	520 x 840 x 750 mm	370 x 520 x 790 (680 without balcony) mm
Electrical power requirements	230 VAC ±10%, 50/60 Hz; 16 A fuse	230 VAC ±10%, 50/60 Hz; 20 A fuse
Thermal Dissipation	N.A.	At 1100°C: P = 1000W = 3500 BTU/h At 1350°C: P = 1500W = 5200 BTU/h
Weight	Approx. 150 kg	Approx. 53 kg

*1 Other configurations / working ranges on request

*2 One sigma deviation of blank and/or sample measurements

THEORY OF OPERATION

The ELEMENTRAC CS-d measures carbon and sulfur concentrations in organic and inorganic samples via different combustion techniques followed by IR detection. Inorganic samples like iron, steel, cast iron, copper, ceramics are combusted together with typical accelerators (e.g. tungsten) in the induction furnace at temperatures above 2000°C, whereas organic samples like coal, coke, soil are combusted in the resistance furnace at temperatures of approx. 1350°C. For both furnaces a common detection unit, consisting of up to 4 element selective IR cells is used to measure the gaseous combustion products SO₂ and CO₂.

AVAILABLE CONFIGURATIONS

Due to a wide variety of samples ELTRA provides different configurations to fit the user's requirements. On the one hand powerful configurations with 4 IR cells are available to cover a wide working range (like 88200-1133) for carbon and sulfur, on the other economic priced single element analyzers with one or two IR cells (like 88200-1111) are available when a reduced working range (e. g. only carbon measurement) is required.

The ELTRA CS-d series can be equipped with customized IR cells to extend the working range for special applications. ELEMENTRAC CS-d IR cells use a massive gold tube as IR path to provide a higher resistance versus halogens and acids:

Examples of configurations and working range (further working ranges on request):

ELTRA Part Number	Cell Configuration	Working range induction furnace (1000 mg sample weight)	Working range resistance furnace (350 mg sample weight)
88200-1211	(2C): Carbon only	Carbon 0.00012 – 7%	Carbon 0.004 – 62.8%
88200-1212	(2S): Sulfur only	Carbon 0.00012 – 7%	Carbon 0.004 – 62.8%
88200-1217	(2C) ; (1S) Full Carbon, Reduced Sulfur	Carbon 0.00012 – 7% Sulfur 0.00006 – 0.28%	Carbon 0.004 – 62.8% Sulfur 0.0007 – 1.7%

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