



KARBON / HIDROJEN / KÜKÜRT ANALİZÖRÜ  
ELEMENTRAC CHS-r

**For the safe, precise and reliable analysis of carbon (C), sulfur (S) and hydrogen (H) in predominantly organic matrices such as soils, waste, wood, oil, coal and coke, ELTRA offers the elemental analyzers ELEMENTRAC CHS-r with IR detection.**

The CHS-r with up to 3 infrared cells is designed for carbon, sulfur and hydrogen measurement over a very wide concentration range. It uses a horizontal resistance furnace with ceramic tube, which operates in a range from 600 °C to 1550 °C.

The CHS-r combustion analyzer meets or exceeds the requirements of all common ASTM, DIN, EN or ISO standards for elemental analysis.



## KARBON / KÜKÜRT ANALİZÖRÜ ELEMENTRAC CHS-R

- | Fast, simultaneous measurement of carbon, sulfur and hydrogen
- | High sample weight possible
- | Optimized (low blank) sample port
- | IR path made of solid gold for extended lifetime
- | Wide measuring range from 20 ppm to 100%

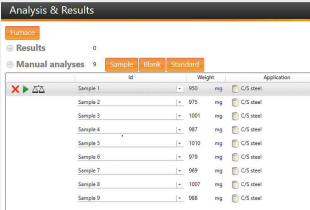


## KARBON / KÜKÜRT ANALİZÖRÜ ELEMENTRAC CHS-R

### OPERASYON VE ANALİZ SÜRECİ

The ELEMENTRAC CHS-r elemental analyzer determines the elements carbon, sulfur and hydrogen by combustion of the sample in an oxygen stream and subsequent measurement of the combustion gases CO<sub>2</sub>, SO<sub>2</sub> and H<sub>2</sub>O in selective infrared measuring cells. A high sample weight of up to 500 mg ensures excellent reproducibility of the measurement results, even for heterogeneous samples.

The high combustion temperatures and electronic monitoring of the oxygen flow allow complete oxidation of the sample and help to avoid too low results even with challenging materials like cement. Regardless of the selected configuration (carbon - sulfur - carbon/sulfur - carbon/hydrogen/sulfur), operation is identical in all versions.



id	weight	Application
Sample 1	950 mg	CS steel
Sample 2	975 mg	CS steel
Sample 3	1000 mg	CS steel
Sample 4	1025 mg	CS steel
Sample 5	1050 mg	CS steel
Sample 6	1075 mg	CS steel
Sample 7	1100 mg	CS steel
Sample 8	1125 mg	CS steel
Sample 9	1150 mg	CS steel

#### 1. Adım: Örneği ELEMENTS yazılımına kaydetme

Numune kimliği yazılıma kaydedilir ve ağırlık otomatik olarak aktarılır (bkz. Adım 2).



#### Adım 2: Hızlandırıcıların tartılması ve eklenmesi

Volumes of 50 mg to 500 mg are typical for analysis of carbon, hydrogen and sulfur. The sample is directly applied to a carrier (ceramic or Inconel boat) and analyzed without addition of accelerators.



#### 3. Adım: Analiz

The sample is placed in front of the furnace opening and the measurement is started in the software. Subsequently, the shutter opens, and the material can be introduced into the hot furnace. At the same time, the ELEMENTS software continuously records measured values during combustion. Closing the furnace during the measurement is optional and can improve reproducibility.



#### Adım 4: Veri çıkışı ve dışa aktarma

60 to 240 seconds after the analysis has started, the measured carbon, hydrogen and sulfur concentrations are available for export as a report or via LIMS. Depending on the selected configuration, carbon, sulfur and hydrogen values are available for the individual sample.

KARBON / KÜKÜRT ANALİZÖRÜ ELEMENTRAC CHS-R  
**SOLUTIONS & OPTIONS IN DETAIL**

The ELEMENTRAC CHS-r analyzer comes with various solutions for reliable, and precise carbon, hydrogen and sulfur analysis.

**Included: Two Anhydron Columns**

For reliable analysis of carbon and sulfur, the combustion gases must be freed from water vapor prior to IR detection. The CHS-r elemental analyzer has two drying columns filled with magnesium perchlorate to reliably prevent absorption effects in large sample volumes.



**Included: Low blank sample port**

The ELEMENTRAC CS-r and CHS-r analyzer series ensures safe and precise elemental analysis even of samples with low carbon content in the resistance furnace. Due to the optimized geometry of the sample port with reduced diameter, as well as an oxygen purge at the sample inlet, the CO<sub>2</sub> blank value of the atmosphere during sample introduction is drastically reduced, thus enabling reliable carbon analysis in the low measuring range.



**Option: Second Furnace (ELTRA Dual Furnace Concept)**

The CHS-r elemental analyzer can be connected in any configuration to an additional furnace without detectors. This principle, known from the ELEMENTRAC CS-d, allows fast fractionated analysis by applying different temperatures and provides



safety for high sample throughput.

## Option: Monitor Holder

To make the most of laboratory space, the ELEMENTRAC CHS-r analyzer offers various operating options:

- | External monitor and keyboard
- | Monitor holder, wireless keyboard
- | Operation via touchscreen



## Option: TIC Module

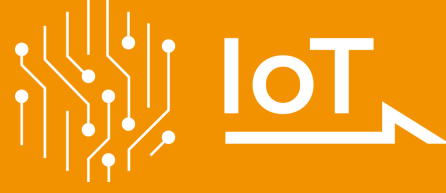
Depending on the sample, carbon can also be present in the two different fractions TOC (Total Organic Carbon) or TIC (Total Inorganic Carbon). The CHS-r elemental analyzer can be combined with ELTRA's TIC module to determine the TIC content via acidification. This combination enables reliable, direct TIC analysis in soils, building materials and other products in compliance with DIN EN 15936.



IOT - INTERNET OF THINGS

## THE PLATFORM FOR REMOTE ACCESS TO YOUR DEVICES

All ELTRA analyzers seamlessly integrate with the Verder Scientific IoT platform, providing enhanced functionality, seamless connectivity, and additional benefits:



- | **Real-time Monitoring:** Gain insight into the status of your machines at any time thanks to immediate access to important data.
- | **Live Notifications:** Stay up to date on the status of your devices with instant notifications.
- | **Effortless Backup:** Whether you need to back up a single device or an entire fleet, back up your data effortlessly and minimize downtime.
- | **Automatic Software Updates:** Verder Scientific IoT keeps your device software up to date, optimizing performance and reliability.
- | **Access to Analysis Data:** ELTRA analyzers offer remote access to analysis data. This allows you to conveniently access important data while on the move.
- | **Autoloader Efficiency:** Get the most out of remote analysis preparation with our autoloader feature, which ensures uninterrupted operation and increased productivity for all instruments equipped with it.

Experience the power of the Verder Scientific IoT platform today and unlock the full potential of your ELTRA analyzers!

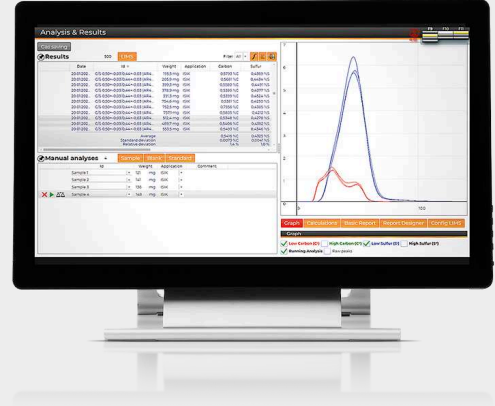


**FREE SOFTWARE  
DOWNLOAD**

KARBON / KÜKÜRT ANALİZÖRÜ ELEMENTRAC CHS-R  
**ELEMENTS YAZILIMI**

**Kapsamlı Windows tabanlı ELEMENTS yazılımı, tüm ELEMENTRAC nesil element analizörlerinin önemli bir parçasıdır.**

Merkezi bir pencere (analiz ve sonuçlar), günlük rutin için gerekli tüm işlemlere kolayca erişilebilen başlangıç noktasıdır. Buradan analiz edilen numuneleri gruplamak ve dışa aktarmak veya yeni numuneleri kaydetmek ve analiz etmek mümkündür. Kullanıcı, uygulama ayarları, kalibrasyon, teşhis veya durum gibi çeşitli alt işlemleri çağırabilir.



KARBON / KÜKÜRT ANALİZÖRÜ ELEMENTRAC CHS-R  
**TIPIK ÖRNEK MALZEMELER**

biokütle, Yapı malzemeleri, coal/Kok, fuels, Yağ, Cevher, Planlama malzemeleri, Plastik maddeler, Kauçuk, Toprak, Kurum, Tütün, Atık, ...



coal



Toprak



plastic

KARBON / KÜKÜRT ANALİZÖRÜ ELEMENTRAC CHS-R

## FONKSİYON PRENSİBİ

In the elemental analyzer CHS-r the sample is burnt in an oxygen atmosphere at temperatures up to 1,550 °C. The furnace temperature can be freely selected in steps of 1 °C. The combustion gasses (CO<sub>2</sub>, H<sub>2</sub>O, SO<sub>2</sub>) coming from the furnace and first pass through a dust filter and then into the heated H<sub>2</sub>O infrared cell. After the water vapor is chemically absorbed, the dried CO<sub>2</sub> and SO<sub>2</sub> gas is detected in the additional infrared cells. Depending on the configuration, it is possible to combine up to three infrared cells with different sensitivities.

KARBON / KÜKÜRT ANALİZÖRÜ ELEMENTRAC CHS-R

## TEKNİK VERİ

<b>Ölçülen elementler</b>	hidrojen, karbon, sülfür
<b>Numuneler</b>	organik
<b>fırın sıralama</b>	horizontal (resistance furnace)
<b>Numune taşıyıcı</b>	seramik kayıklar
<b>Uygulama alanı</b>	biyoloji, kimya / plastik..., tarım
<b>Fırın</b>	rezistans fırını (seramik tüp)
<b>Tespit metodu</b>	katı kızıl ötesi absorpsiyonu
<b>IR hücre sayısı</b>	1 - 3
<b>IR yolunun malzemesi</b>	altın
<b>Analiz süresi</b>	60 - 180 s
<b>Gerekli kimyasallar</b>	magnezyum perklorat, sodyum hidroksit
<b>Gerekli gaz</b>	oksijen 99.5 % saflıkta (2 - 4 bar / 30 - 60 ...
<b>Güç Gereksinimleri</b>	230 V, 50/60 Hz maks. ısıtma akım 20...
<b>Ebatlar (G x Y x D)</b>	58 x 52 x 75 cm
<b>Ağırlık</b>	~ 77 kg
<b>Gerekli ekipmanlar</b>	PC, monitör, terazi (hassasiyet 0.0001g...
<b>Opsiyonel aksesuarlar</b>	TIC modülü






[www.eltra.com/chs-r](http://www.eltra.com/chs-r)

## SIPARIŞ BİLGİSİ

### ELTRA ELEMENTRAC CHS-R

Measuring ranges at 350 mg sample weight  
(alternative configurations on request)

2)

88200-3100		CHS-r	1xC + 1xH + 1xS	0.03 – 100 % C 0.002 – 4.2 % H 0.001 – 1.14 % S
88200-3101		CHS-r	1xC + 1xH + 1xS	0.03 – 100 % C 0.002 – 4.2 % H 0.01 – 3.42 % S
88200-3102		CHS-r	1xC + 1xH + 1xS	0.03 – 100 % C 0.002 – 4.2 % H 0.005 – 2.28 % S
88200-3103		CHS-r	1xC + 1xH + 1xS	0.004 – 21 % C 0.002 – 4.2 % H 0.001 – 1.14 % S
88200-3109		CHS-r	1xC + 1xH + 1xS	0.03 – 100 % C 0.002 – 4.2 % H 0.05 – 31.4 % S



Talep üzerine diğ er ölçüm aralığı kombinasyonları mevcuttur.

### GEREKLI AKSESUARLAR

PC, MONİTÖR, TERAZİ

71015-1000	Intel Core i5-8400 işlemci, 256 GB SSD olan bilgisayar; 8 GB RAM; Windows 10 işletim sistemi; klavye; mouse
88400-0584	Monitor, TFT (23.8 inch)
88400-0645	Terazi (çözünürlük 0.0001 g)


İLK İŞLEMLER İÇİN GEREKLI SARF MALZEMELERİ / KİMYASALLAR


88500-0004	ELEMENTRAC CHS-r Starter-kit for 500 analyses (500 disposable porcelain boats, 50 g glass wool, 50 re-usable boats, 100 g Combsolid)
90200	 Anhidron (magnezyum perklorat), 454 g 1)
90210	 Sodyum hidroksit, 500 g 1)

## DIĞER SEÇENEKLER VE SARF MALZEMELERİ

### KİMYASALLAR (CAM VE KUVERS TÜPLER İÇİN DOLGULAR)

90200  Anhidron (magnezyum perklorat), 454 g 1)

90210  Sodyum hidroksit, 500 g 1)

90331  Cam yünü, 454 g

90332  Cam yünü, 50 gr

92610  Yüksek vakum gres tüp, 35 g

88600-0008  Combsolid, 100 g 1)


91000-1005  Bakır, pul, 25 g

90840  Quartz kumu, 100 g


88400-0508  Çelik yün

### KAYIKÇIKLAR

90160  Tek kullanımlık porselen kayıkçıklar 86 x 13 x 10 mm, 1000 adet

90153  Yeniden kullanılabilir seramik kayıkçıklar, premium, 58 x 22 x 14 mm, 500 parça

88600-0011  Yeniden kullanılabilir seramik tekneler, 95 x 13 x 10 mm, 500 parça

88400-0502  Yeniden kullanılabilir inconel bot, 54 x 18 x 13,5 mm, 1 adet

88400-0503



Yeniden kullanılabilir inconel bot, 54 x 18 x 9 mm, 1 adet

## YARDIMCI İŞLEM ARAÇLARI: SPATULA, CIMBIZ, MAŞA VE DİĞERLERİ

88400-0229



Cımbız (160 mm), kıvrımlı, 1 adet

88400-0472



Cımbız (145 mm), düz, 1 adet

88400-0475



Birden fazla tartım prosedürü için 6 spatula ve 1 cımbız-tırnaklı set

90145



Seramik potalar ve tekneler için maşa, 220 mm, 1 adet

88600-0009



Kenar korumalı ekran camı

88400-0499



Koruma gözlükleri

36216-2001

Yakma botu yerleştirme çubuğu, 1 adet

36218-2001

Yakma kayıkçığı çıkarma çubuğu, 600 mm, 1 adet

## SAKLAMA, TAŞIMA VE TARTMA ARAÇLARI

88400-0477



Tartım teknesi, 1 adet tablet - granüllerin tartılması ve kullanılması için

## BAKIM İÇİN ARAÇLAR

88400-0473



Toz hunisi (plastik), kimyasal tüplerin kolay doldurulması için 1 parça sekme

88400-0490



Rubber plug 29 x 35 x 30 mm, 1 piece for sealing big glass tubes like 09090

71010



Fırça, 16 mm, 1 adet tırnaklı - teraziye tozdan arındırmak için

88600-0026

Anhydron filter tube  
1)

glass tube filled with Anhydron

## KALIBRASYON MALZEMELERİ

**Kalibrasyon malzemeleri, mevcut partiye bağılı olarak küçük farklılıklar gösterebilir.**

**Mevcut sertifikayı görmek için lütfen [www.ELTRA.com](http://www.ELTRA.com) adresini ziyaret edin.**

### KÖMÜR: SERTİFİKALI KÜKÜRT İÇERİĞİ

92511-3005 Kömür, 50 g, <0.1 % S

92511-3010  Kömür, 50 g, 0.1 – 0.5 % S

92511-3020  Kömür, 50 g, 0.5 – 1.0 % S

92511-3030  Kömür, 50 g, 1.0 – 1.5 % S

92511-3040  Kömür, 50 g, 1.5 – 2.0 % S

92511-3050  Kömür, 50 g, 2.0 – 3.0 % S

92511-3060  Kömür, 50 g, 3.0 – 4.0 % S

92511-3070  Kömür, 50 g, 4.0 – 5.0 % S


92511-3080  Kömür, 50 g, >5.0 % S

### KÖMÜR, PREMIUM, C / H / N / S, KÜL, UÇUCU İÇERİK, SERTİFİKALI

92550-3010 Kömür, premium, 50 g, > 1 % S

92550-3020  Kömür, premium, 50 g, > 1 % S

92550-3040  Kömür, premium, 50 g, 1.0 – 3.0 % S

92550-3060  Kömür, premium, 50 g, > 3.0 % S

### KOK, PREMIUM, C / H / N / S, KÜL, UÇUCU İÇERİK, SERTİFİKALI

92560-3010



Kok, premium, 50 gr

## PET KOK, PREMIUM, C / H / N / S, KÜL, UÇUCU İÇERİK SERTİFİKALI

92570-3020

Pet kok, premium, 50 g, > 1 % S

92570-3040

Pet kok, premium, 50 g, > 1 % S

## DIĞER

90812-3001



Kireçtaşı, 25 g, 0.04 % S

90812-3002



Kireçtaşı, 25 g, 0.4 % S

90812-3003

Kireçtaşı, 25 g, < 5 % C

90812-3004

Kireçtaşı, 25 g, 5 – 10 % C

90817-3001

Toprak, 25 g, > 2 % C, S

90817-3002

Toprak, 25 g, < 1 % C, S

90817-3003

Toprak, 25 g, > 2 % C, S

90817-3004

Toprak, 25 g, < 2 % C, < 1 % S, < 2 % C; < 1 % S

91900-1001



Cevher, 30 g, ~1.4 % S

91900-1002



Cevher, 30 g, ~4.2 % S

91900-1003

Cevher, 30 g, ~3 % S

## KALIBRASYON İÇİN BİRİNCİL MADDELER, 32 % S

90710-3010



EDTA, 50 g

90710-3030

Sucrose, 50 g

90810



Kalsiyum karbonat, 100 g

90821



Baryum sülfat, 50 g

90824



Sülfanilik asit, 50 g

91900-2001

Çinko sülfür, 50 g, 32 % S

SIVI KALIBRASYON MALZEMESİ

**Lütfen dikkat: Her analizör için ayrı olarak sipariş edilmesi gereken PC, monitör, terazi ve bazı sarf malzemeleri (potalar, kimyasallar) gerekir.**