5E Series Elemental Analyzer

Models Available	Analysis Contents
5E Series C/H/N Elemental Analyzer	Carbon / Hydrogen / Nitrogen
5E-TCN2200 Nitrogen/Protein Analyzer	Nitrogen/Protein
5E Series Fluorine / Chlorine Analyzer	Fluorine /Chlorine
5E-HGT2320 Automatic Mercury Analyzer	Mercury
5E-IRS3600 Automatic Infrared Sulfur Analyzer	Total Sulfur
5E-IRSII Infrared Sulfur Analyzer	Total Sulfur
5E-AS3200B Automatic Coulomb Sulfur Analyzer	Total Sulfur
5E-S3200 Coulomb Sulfur Analyzer	Total Sulfur

Elemental analysis and testing include identification and quantification of elements in a sample, determination of the elemental composition and trace level elements.With CKIC as your partner, we can meet your elemental analysis needs for carbon, hydrogen, nitrogen, sulfur, chlorine, fluorine and mercury.

5E Series C/H/N
Elemental Analyzer

Models Available

◎ 5E-CHN2200 to test Carbon, Hydrogen, Nitrogen content
◎ 5E-CH2200 to test Carbon, Hydrogen content
◎ 5E-TCN2200 to test Nitrogen/Protein content
◎ 5E-IRH2200 to test Hydrogen content
◎ 5E-IRC2200 to test Carbon content

Standard Configuration

Computer
Printer
Main analyzer
Furnace reagent
High purity copper
N-Catalyst
H_2O sorb reagent
CO_2 sorb reagent
Silica wool
Lower crucible
Upper crucible
O-ring kit
Tool kit

Optional Configuration

AR427 com-aid for liquid sample
Additional 2~4 layers carousels
4cm×4cm size tin-foil cup
Bigger size hole carousel

Up to 140 samples
Stackable auto loader
to 4 layers

Application

5E Series C/H/N Elemental Analyzer is used to determine carbon, hydrogen,nitrogen/protein content in solid and liquid material, such as coal, coke, oil, petroleum,biomass, fertilizer, plastic, food, hydrocarbons, plant tissue, leaves and tobacco, which is widely applied in power plants, coal mines, metallurgy, chemical industry, commercial inspection, scientific research, food industry, education etc.

Features

Maximum Efficiency

1. High throughput: standard auto loader for 35 samples per layer, stackable to 4 layers available.
2. Analysis time: 4-6 mins per sample.
3. Dual-stage furnace system with pure oxygen flow to ensure the complete combustion of all samples.

Good Environment Adaptability

1. Optimum gas circuit provides good gas tightness of the system.
2. O-ring free from heat resource.

Minimum Consumption

1. Independent detectors to determine C, H, N respectively(IR for C,H, TCD for N). Analysis of CH mode and CHN mode can be chosen on software. (For 5E-CHN2200)
2. Saving time, gas and reagent: only 5.5ml blended gas needed to be analyzed.

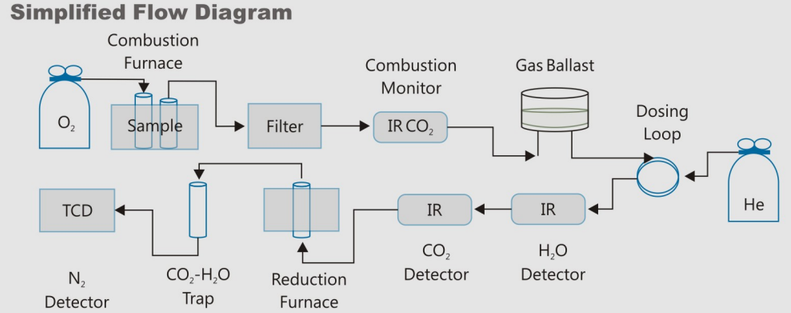
Unattended Operation

The operator is limited to just adding sample to auto sample loader. Then the instrument will finish the test, cool down and shut off automatically.

Working Principle

An encapsulated sample is placed into the loading head of the CHN2200, which is sealed and purged. The sample is then dropped into a hot furnace which contains high pressure pure oxygen, for very rapid combustion. Dust and ash are filtered before collection in the gas ballast. These collected gases are mixed, and then an aliquot dose is analyzed with IR detectors to give Hydrogen and Carbon value. All the gases pass through a reduction catalyst in order to form molecular nitrogen. Then CO_2 and H_2O trap ensure that only N_2 goes inside the TCD to be detected. The system is controlled by external PC using Windows based operating software.

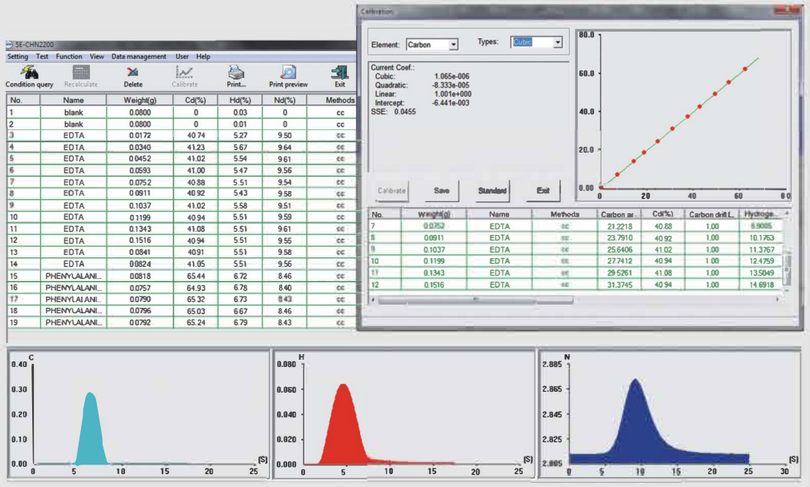
Simplified Flow Diagram



Custom Configuration, Maximum Flexibility

	Carbon-IR	Hydrogen-IR	Nitrogen-TCD
CHN	✓	✓	✓
CHN	✓	✓	
CN	✓		✓
H		✓	

Intelligent Software System



Specification

Model	5E-CHN2200		
Conforms to Method	ASTM D5373, ISO 29541, GB/T 30728 and GB 30733		
Analysis Time	4-6mins, depending on sample combustion conditions		
Sample Loader	Stackable auto loader, up to 140 samples by 4 layers		
Repeatability	Carbon(Cad)≤0.45%, Hydrogen(Had)≤0.10%, Nitrogen(Nad)≤0.05%		
Sample Mass	Up to 1000mg, depending on sample matrix		
Temp. Resolution	1°C		
Gas Required	Helium, 99.99%, 0.25 ± 0.01Mpa		
	Oxygen, 99.99%, 0.25 ± 0.01Mpa		
	Nitrogen or compressed air, 0.25 ± 0.01Mpa		
Consumption	Helium 200ml/min		
Measurement Range	Carbon : 0.02mg-150mg	Hydrogen : 0.1mg-12mg	Nitrogen : 0.04mg-50mg
Furnace Type	Resistance furnace , max. temp 1050°C		
Power Supply	Single phase, AC220 ±10% , 50/60Hz, 5.5kW		
Net Weight	110kg		
Dimensions(L×W×H)	690mm×750mm×720mm		

5E-TCN2200
Nitrogen/Protein Analyzer

Application

The Nitrogen Protein Analyzer is a powerful Dumas Protein/Nitrogen Analyzer, able to perform precise nitrogen analysis and protein determination, Known also as "Combustion method", it ensures precise results in few minutes, breaking down the sample into its elemental compounds. Substances produced, such as H_2O, O_2 and CO_2, are trapped and removed, in order to ensure the correct detection of the nitrogen. It's an alternative to Kjeldahl method for the determination of nitrogen and protein content in different types of sample such as Food, feed, soil and liquids. Dumas method is the faster official one, validated by different International Organizations, such as AOAC, AACC, ASBC, ISO, OIV, etc.

Specification

Model	5E-TCN2200
Conforms to Method	AOAC990, AACC ASBC ISO OIV GBT/30728, ISO 16634
Analysis Time	4-6 mins, depending on sample combustion conditions
Sample Loader	Stackable auto loader, up to 140 samples by 4 layers
Repeatability	Nitrogen(Nad) ≤ 0.05%
Sample Mass	Up to 1000mg, depending on sample matrix
Temp. Resolution	1°C
Gas Required	Helium, 99.995%, 0.25 ± 0.01Mpa
	Oxygen, 99.995%, 0.25 ± 0.01Mpa
	Nitrogen or compressed air, 0.25 ± 0.01Mpa
Consumption	Helium 200ml/min
Measurement Range	Nitrogen: 0.04mg-50mg
Furnace Type	Resistance furnace , max. temp 1050 °C
Power Supply	Single phase, AC220 ±10% , 50/60Hz, 5.5kW
Net Weight	110kg
Dimensions(L×W×H)	690mm×750mm×720mm

5E Series
Fluorine / Chlorine Analyzer

Models Available

◎ 5E-FL2350 to test Fluorine and Chlorine content
◎ 5E-FT2300 to test Fluorine content
◎ 5E-CLT2310 to test Chlorine content

Application

5E Series Fluorine / Chlorine Analyzer is used to determine the fluorine and chlorine in coal or other combustibles by combustion hydrolysis method (Ion selective electrode method for F and potentiometric titration method for Cl), which is widely applied in coal-fired plants, coal mines, steel plants, petrochemical industry, etc.

Features

High Automation
Automatic analysis process and quick analysis results available after sample loading.

High Efficiency
Unattended operation with the protection of lack or overflow of water level.

High Safety Assurance
Two sample analyses for each batch and continuous analysis available.

Flexible Layout
No water tap is required around the instrument as it is equipped with water tank

Specification

Model	5E-FL2350	
Conforms to Method	Fluorine: GB/T 4633, ASTM D5987, ISO 587, AS 1038.10.4 Chlorine: GB/T 3558, ASTM D6721, ISO 11724, SN/T 3596	
Measuring Range	Fluorine: 10-2000 ug/g	Chlorine: 0.003-0.4%
Sample Mass	0.5g	
High temp Furnace Precision	1100 ±10°C	
Analysis Time	1. Decomposition	35mins
	2. Calibration of electrode parameters	available to calibrate when decomposing the first batch of samples and not calculated to total analysis time
	3. Titration	fluorine: 15 mins / chlorine: 15 mins
	For dual sample analysis: 65 min ; For continuous analysis : 17.5 min/ sample (average)	
Sensitivity of Electrode Potential	0.1mV	
Minimum Filling of Injection Pump	50μL	
Accuracy	Within uncertainty range of standard sample	
Repeatability	15μg/g (Fad≤150μg/g), 10% (Fad＞150μg/g), 0.010% (CLad)	
Power Supply	Single phase, AC220±10%, 50/60Hz, ≤3.5kW	
Net Weight	Analysis Unit:130kg, Reservoir: 30kg	
Dimension (L×W×H)	Analysis Unit: 1400mmx600mmx610mm , Reservoir: 900mmx500mmx510mm	

5E-HGT2320
Automatic Mercury Analyzer

Application

5E-HGT2320 Automatic Mercury Analyzer is used to determine the mercury in liquid and solid material such as coal, coal fly ash, soil, sludge, sediment, ore, mineral, foodstuff, waste water and fodder.

Features

1. Maximum throughput with auto-loader, available for 56 samples per batch and easy to add or reduce sample quantity during analysis.
2. Intelligent sample position recognition, complete analysis automatically within 5 minutes per sample.
3. Auto self-diagnosis system to determine if the test results are acceptable according to the predefined standard.
4. Optional exhaust gas treatment system is available to ensure fresh lab environment.

Specification

Model	5E-HGT2320
Conforms to Method	US/EPA 7473 and ASTM D6722
Test Method	Atomic Absorption Method
Sample Quantity	56 samples per batch
Analysis Range	0.01ng~1000ng
Sample Mass (mg)	coal and coke: 40-200 (80 recommended)
Analysis Time (s)	Around 480
Precision	Conforms to ASTM D-6722
Power (kW)	≤3
Weight (kg)	30
Dimensions(L×W×H)	500mm×460mm×350mm

5E-IRS3600
Automatic Infrared Sulfur Analyzer

Standard Configuration

Computer	Crucibles
Printer	Outer combustion tube
Main analyzer	Inner combustion tube
A/C adapter	Boat stop
Anhydrone	O-ring kit
Silica wool	Tool kit

Up to 60 samples per batch automatically

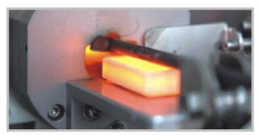
Application

5E-IRS3600 Automatic Infrared Sulfur Analyzer is used to determine the total sulfur content by infrared absorption, which is widely applied in power plants, coal mines, metallurgy, chemical industry, commercial inspection, scientific research, etc.

Features

High Automation

1. Unique dual oxygen lance to increase the combustion efficiency
2. Maximum throughput with auto-loader, available for 60 samples per batch and easy to add or reduce sample quantity during analysis.
3. Patented sample delivering system realizes smooth work flow of pulling and discharging samples.
4. The sample mass can be automatically sent to the computer by balance connection.
5. Available for unattended operation by intelligent sensor.
6. Auto self-diagnosis and language alert.



Accuracy and Stability

1. Top quality ultra-low drift infrared cell to ensure stability of the testing results.
2. Reliable single Si-C spiral tube heating components.
3. Unique gas tightness structure to avoid the effect of SO_2 in air.

Easy Operation

1. Optimized gas circuit to minimize maintenance time.
2. Digital display for gas flow.

Environmental Protection

Exhaust emissions ventilation system to avoid air pollution of laboratory.

5E-IRSII
Infrared Sulfur Analyzer

Standard Configuration

Computer	A/C adapter	Crucibles	Boat stop
Printer	H_2O sorb reagent	Outer combustion tube	O-ring kit
Main analyzer	Silica wool	Inner combustion tube	Tool kit

Unique "Quick Start" Button

Application

5E-IRSII Automatic Infrared Sulfur Analyzer is used to determine the total sulfur content by infrared absorption, which is widely applied in power plants, coal mines, metallurgy, chemical industry, commercial inspection, scientific research, etc.

Features

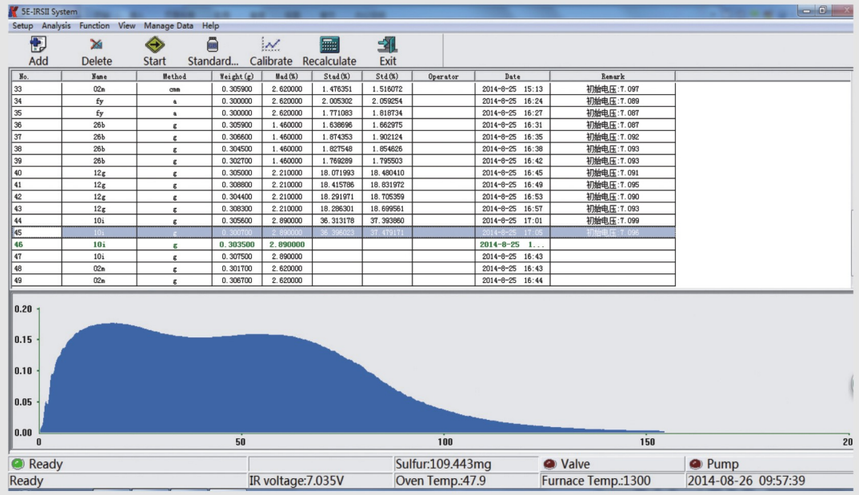
Stability and Accuracy

1. Top quality ultra-low drift infrared cell to ensure stability, precision and accuracy.
2. Reliable single Si-C spiral tube heating components.
3. Unique gas tightness structure to avoid the effect of SO_2 in air.

Easy Operation

1. The sample mass can be automatically sent to the computer by balance connection.
2. Upgraded gas circuit design and reliable components to minimize the maintenance work.
3. Unique "Quick Start" button to simplify the operation.

Intelligent Software System



Test Data

Sample Name	Sample Weight	Mad (%)	Stad (%)	Std (%)	
Control 6H0160-1	0.3092	5.16	2.482	2.617	
Control 6H0160-2	0.3077	5.16	2.496	2.632	
Average				2.624	(+/-0.066)
Reference Value				2.625	
ASTM D4239-10 Repeatability Limit (r)				0.099	
ASTM D4239-10 Reproducibility Limit (R)				0.256	
Repeatability				0.015	
Reproducibility				0.001	
Conclusion: 5E-IRSII Infrared Sulfur Analyzer exceeds the ASTM Precision Requirement					

Specification

Model	5E-IRS3600	5E-IRSII
Conforms to Method	ASTM D4239, ISO19579 and GB/T25214	
Max. Sample Loading	Up to 60 samples per batch automatically	1 sample per batch manually
Analysis Method	Infrared absorption	
Analysis Resolution	0.001%	
Sulfur Range	0.01%-30% customized range available	
Analysis Time per Sample	≤120s	
Analysis Temp	1350°C	
Temp. Control Precision	± 1°C	
Sample Mass	200mg-400mg for coal and coke (300mg is recommended)	
Power Supply	Single phases, AC220±10%, 50/60Hz, ≤4kW	
Net Weight	70kg	60kg
Dimensions(L×W×H)	750mm×650mm×700mm	510mm×700mm×620mm

5E-AS3200B
Automatic Coulomb Sulfur Analyzer

Standard Configuration

Computer
Printer
Main analyzer
Electrolytic cell
Potassium bromide
Potassium iodide
Glacial acetic acid
Tungsten trioxide
Silica wool
Crucibles
Tool kit

Optional Configuration

Quartz sand for oil testing

Application

5E-AS3200B / 5E-S3200 Coulomb Sulfur Analyzer is used to determine the total sulfur content in coal and liquid fuel. A sample is combusted in a dry air atmosphere; the gases evolved go to a electrolytic cell containing platinum indicating electrodes and platinum electrolysis electrodes. A small current is produced as the sulfur reacts with electrodes; the current is balanced and equivalent to the amount of sulfur present in coal.

Features

Easy Operation

1. Auto self-diagnosis.
2. Protect heating components by over temperature alarms and auto heating off function.
3. Large volume reagent tube to minimize the maintenance of changing the reagent.

Cost Saving

The test can be performed without oxygen, and the desiccant can be used repeatedly.

Additional feature for 5E-AS3200B

The operator is limited to just loading the sample onto the auto-loader.

5E-S3200
Coulomb Sulfur Analyzer

Standard Configuration

Computer
Printer
Main analyzer
Electrolytic cell
Potassium bromide
Potassium iodide
Glacial acetic acid
Tungsten trioxide
Silica wool
Crucibles
Tool kit

Optional Configuration

Quartz sand for oil testing

Specification

Model	5E-AS3200B	5E-S3200
Conforms to Method	GB/T214	
Analysis Resolution	0.01%	
Max. Sample Loading	20 samples per batch automatically	1 sample per batch automatically
Sulfur Range	0.01%-30% customized range available	
Min. Analysis Time	3mins	
Operation Temp	0-1200°C selectable (for coal 1150°C is recommended, for oil 920°C is recommended)	
Temp. Control Precision	± 3°C	
Sample Mass	45-55mg for coal, 80-100mg for oil	
Power Supply	Single phase, AC220±10%, 50/60Hz, 3kW	
Net Weight	57kg	53kg
Dimensions (L×W×H)	996mm×530mm×412mm	968mm×510mm×345mm