H/O/N/C/S DETERMINATORS

First & Best
Since 1972

For Metals & Inorganic Material

- REFRACTORY METALS (Ti,Zr)
- CERAMICS
- SUPERCONDUCTORS
- RARE EARTHS
- UO_2/MOX
- STEELS & FERRO ALLOYS
- ALUMINIUM & Al ALLOYS
- COPPER & COPPER ALLOYS
- NICKEL & NICKEL ALLOYS

MAKE IN INDIA

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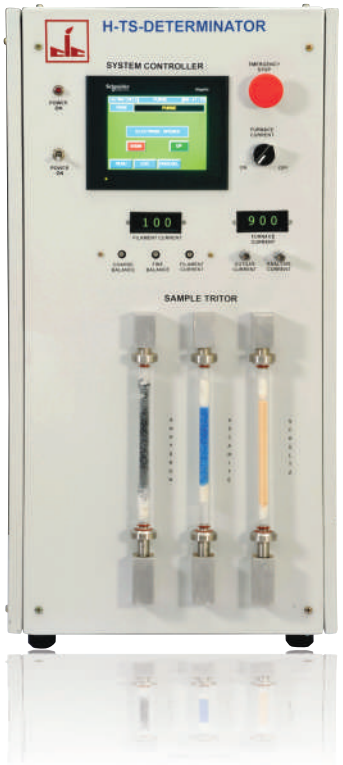
SYSTEM OVERVIEW

These Determinators incorporate the latest technology & design for the rapid, accurate & reliable determination of H / O / N / C / S* in Inorganic Materials requiring high temperature fusion to effectively & completely release these gases. Materials include Refractory metals (Ti, Zr etc.), ferrous & non ferrous metals, Ores, Steel & Steel Alloys.

These Determinators feature user-friendly functions that make it the best & most simple to operate instrument available for the full spectrum of the analysis applications from Research & Development to On Site analysis. The user front panel control using touch screen, specialized Operational Software & Computing software give very high efficiency & accuracy, thus, making the system ideal for trace level analysis of trapped gases in Inorganic material.

IMPORTANT FEATURES

- **Rapid Analysis & Automatic Operation.**
- **Auto Diagnostics prevent system operation in unhealthy system condition.**
- **Calibration by Gas Dosing* & CRM's.**
- **Freely selectable analysis temperature up to approximately 3200°C** depending on model.**
- **Can be used for Laboratory work as well as for Glove box adaptation.**
- **Versatile sample capacity with changeable lower and upper inserts.**
- **Flexible electrode insert configuration to suit various sizes of crucibles.**



THESE DETERMINATORS COMPRISE OF THE FOLLOWING 3 PARTS :

High Temperature Electrode or Impulse Furnace for fusion of the sample using a Graphite or Alumina crucible depending on the system / Model used. The sample is fused here and the liberated gases are swept for analysis by the inert gas used as carrier which is model dependent. All the models are provided with closed loop current control to achieve stable & repeatable currents.

The Control Panel consists of PLC with DI/DO modules, Micro- controllers, High gain amplifiers, drift compensators, Relay modules & Time Sequences programmer with ethernet control. The touch screen panel located on the front panel controls all the operations of the system providing complete control & flexibility. The panel also houses the Gas section for Carrier, Calibration & Air, various types of Valves, Mass Flow Controllers & the high flow high volume TCD & NDIR for H / O / N / C / S detection depending on the system selected.

Windows Based User Friendly Integrating & Control Software. The system also incorporates the powerful PC which is connected to the Analyzer via serial port for computation of the results. The results are displayed on the video screen as well as printed on the printer. The specialized PC software includes many features which are customized to give a proper format of report as desired by the user. The complete control of the determinator is available via the PC optionally on the ethernet bus.

* Select appropriate Model ** Up to 2250 Deg C for C/S with accelerator

NOTE: All functionalities & features cannot be illustrated in catalog & hence please refer the quotation for details

SPECIFICATIONS FOR H / O / N

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HYDROGEN SPECIFICATIONS

Dynamic Range 1g⁎:	0.01 - 100 PPM Low 50 - 5,000 PPM High
Accuracy	± 1% with dosing gas Within 2 Sigma for standards
Precision	± 1% RSD of the range with dosing gas 90% data confidence within 1 sigma (As per ASTM E 1019 / ASTM E 1447)
Readability	0.001 PPM
Minimum Sample Size	10 mg
Detection Method	Macro High Flow TCD (Proprietary) / Micro NDIR with long bench and multiple chopper (Depending on Model)
Time	Analysis time : 150 seconds Nominal (Model Dependent) 120 seconds Fast (Model Dependent) Cycle Time : 180~220 seconds (Model Dependent)

It is important to note that we can specially configure the system as per your application & analysis range as these systems are indigenously manufactured by us. The accuracy / range / sensitivity can be altered to suit your specific requirements.

OXYGEN SPECIFICATIONS

Dynamic Range 1g⁎:	0.01 - 200 PPM at 1 grams sample⁎ - Low Range 100 – 20,000 PPM at 1 grams sample⁎ - Hi Range
Accuracy	± 1% with dosing gas Within 2 Sigma for standards
Precision	± 1% RSD of the range with dosing gas 90% data confidence within 1 sigma (As per ASTM E 1019)
Readability	0.001 PPM
Minimum Sample Size	10 mg
Detection Method	Micro NDIR with long bench & multiple chopper
Time	Analysis time : 180 seconds Nominal (Model Dependent) 150 seconds Fast (Model Dependent) Cycle Time : 210~250 seconds (Model Dependent)

It is important to note that we can specially configure the system as per your application & analysis range as these systems are indigenously manufactured by us. The accuracy / range / sensitivity can be altered to suit your specific requirements.

⁎ Range can be varied with change in Sample size
⁎⁎ Sample size can be varied from 0.01 to 20.0 grams with change of insert & crucible

SPECIFICATIONS FOR H / O / N

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NITROGEN SPECIFICATIONS

Dynamic Range 1g⁎ :	0.01 - 1,500 PPM at 1 grams sample⁎ - Low Range 1000 – 20,000 PPM at 1 grams sample⁎ - Hi Range
Accuracy	± 1% with dosing gas Within 2 Sigma for standards
Precision	± 1% RSD of the range with dosing gas 90% data confidence within 1 sigma (As per ASTM E 1019)
Readability	0.001 PPM
Minimum Sample Size	10 mg
Detection Method	Macro TCD suitable for High Flow (Proprietary)
Time	Analysis time : 240 seconds Nominal (Model Dependent) 210 seconds Fast (Model Dependent) Cycle Time : 240~300 seconds (Model Dependent)

It is important to note that we can specially configure the system as per your application & analysis range as these systems are indigenously manufactured by us. The accuracy / range / sensitivity can be altered to suit your specific requirements.

⁎ Range can be varied with change in Sample size
⁎⁎ Sample size can be varied from 0.01 to 20.0 grams with change of insert & crucible

COMMON SPECIFICATIONS FOR H / O / N ANALYSER VARIANTS

ELECTRODE FURNACE

Upper : Fixed
Bottom : Movable
Type : Water Cooled
Current Range : 300 ~ 1100 Amps with lockable range
Current Control : Closed Loop Current Control
Control Type : Dual independent - Outgas / Analyse
Current Control On-Off : Through TS & Software
Capacity : 10 KW to 15 KW depending on model

ELECTRICAL REQUIREMENTS

Input Voltage : 2 phase , 230 VAC for transformer
: Single phase, 230 VAC for System
Requirement : 3 phase, 32 Ampere

SAMPLE WEIGHT VIS A VIS CRUCIBLE

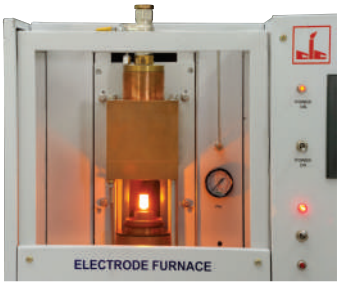
- 15~16 grams for pellets using crucible Type 3 (Special-MOQ)
- 5 grams for metals & alloys using crucible Type 2 (AOR)
- 2 grams for metals & alloys using crucible Type 1 (Standard)

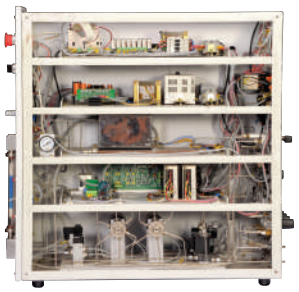
CLOSED LOOP WATER CIRCULATOR

Operating Temp Range : + 18°C to 24 °C
Line Voltage : 230 V AC 50 Hz
Line Power : 900 Watts
Flow Rate : 20 Litres/Min.
Water Reservoir Cap.: 30+ Litres
Water Quality : Bi-Distilled
Safety Interlock : By Flow Switch / Level Switch / Temperature (As ordered)

SYSTEM CONFIGURATIONS AVAILABLE

- **HYDROGEN (H)**
- **OXYGEN (O)**
- **NITROGEN (N)**
- **OXYGEN - HYDROGEN (OH)**
- **OXYGEN - NITROGEN (ON)**
- **HYDROGEN - OXYGEN - NITROGEN (HON) - OH or ON**
- **HYDROGEN - OXYGEN - NITROGEN (HON) - SIMULTANEOUS**





CARBON & SULFUR (CS-2020) DETERMINATOR

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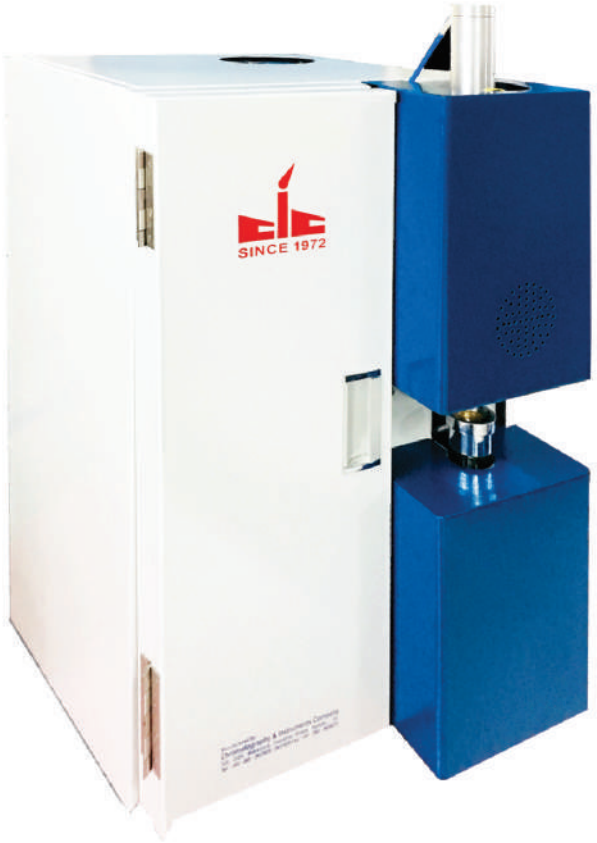
System Highlights

The CS -2020 Carbon Sulfur Detector incorporates the Latest Technology & Design for the rapid, accurate and reliable determination of Carbon & Sulfur in Inorganic Materials requiring high temperature fusion to effectively & completely release these gases. Materials that can be analysed include Cast Iron, Steel & Alloys, Copper, Titanium, Zirconium besides Ores, Coal, Cement etc.



CS 2020 Key Features

- Rapid Analysis & Automatic Operation (35 to 60 seconds)
- Auto Diagnostics prevents system operation in unhealthy condition. Software also controls the System in totality.
- Single / Multi point Calibration by using standards.
- Versatile sample capacity from 10 mg to 1500 mg.
- Automatic Furnace clean up using Dual Brush Technology.
- 2.2 KVA furnace with 20 MHZ frequency.
- Variable Furnace Heating Time, Analysis Time & Purge Time.
- Digital Display of Grid Current & Anode Current.
- Can be used for Laboratory work as well as for Glove box adaptation for the Nuclear Industry.

1 PPM to 6% Carbon & 1 PPM to 3.5% Sulfur with range extendable to 99%* (Pre Select while ordering)

Sample Range from 10 ~ 1500 mg with nominal sample size of 500 mg

CS 2020 DETERMINATOR MAIN MODULES

Induction Furnace for fusion of the sample using a ceramic crucible for Carbon & Sulfur analysis. The High Frequency Induction Furnace for C & S uses a closed loop current control to achieve stable & repeatable currents.

The Control Panel consists of a Micro- controller based system with high gain amplifiers, drift compensators, Relay modules and time Sequences programmer with serial control through USB cable . The complete system is controlled from the Touch Screen or PC using the USB port and the front panel has additional control for the analysis start, electrode up & down. The front panel has two digital indicators to display the grid current & anode current besides the oxygen carrier pressure gauge and the flow indicating controllers. The system incorporated special infra red cells for Carbon & Sulfur analysis with an option for using additional benches for low Carbon & sulfur analysis. A special feature is provided for auto cleaning of the quartz tube by press of a button.

Windows Based User Friendly Integrating & Control Software The system incorporates the powerful Software loaded in PC which is connected to the Analyzer via USB for computation of the results.

CARBON & SULFUR (CS - 2020) DETERMINATOR

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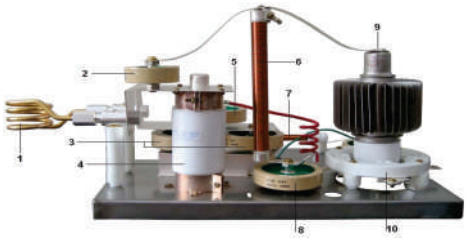
Operation & Safety

The CS 2020 Carbon Sulfur Determinator is designed keeping in mind the demanding Indian conditions i.e. Ruggedness, Easy maintenance , Reproducibility & Sensitivity in industrial environment, thus making the task of an analysis a pleasure. The entire sequence involves loading the crucible and pressing the analysis button to complete the automatic operation up to the computation of the results. The PC automatically determines the gas contents, displays the results on the monitor & provides the print out of the calculated gas content in a user defined format.

A built in Auto Diagnostic sequence permits the system to detect any electronic and mechanical fault and thereby prevent use of the system in unhealthy condition. The system is built to monitor up to 26 parameters continuously to ascertain the healthy condition of the system and provide the user with a failsafe operation. An inbuilt diagnosis feature prompts the user to change chemicals or clean the furnace.



High Frequency Induction Furnace

Sample is fused in a pre heated ceramic crucible with help of accelerators using the powerful 2.2 KW Induction Furnace with 20 Mhz Frequency to achieve temperatures up to 2200^{0}C. The adjustable grid & plate current current is displayed on the front Panel.

Detection System & Calibration

The evolved gases, Carbon &/or Sulfur after the fusion in the induction furnace pass through specially designed high flow & low volume NDIR Detector with bench length in excess of 350 mm for quantification. The NDIR Detectors are isothermally stable over a wide temperature range & utilizes a 24 bit ADC for the accurate control and measurement of the evolved gases. The detectors use special compensation technique to avoid the drift due to temperature & barometric variations. *The standard configuration of the systems has a detector for the Carbon analysis and Sulfur analysis with an option for the addition of an additional detector for each detector bank for a specific analysis range.*

The system can work with single point or multipoint calibration or selection of best fitting linearizing curve as per the standard analysis results to give results with high precision and accuracy. The biggest advantage is the inbuilt curve values which are factory fed which makes the job easier for the user as just changing the coefficient after standard analysis modifies the curve appropriately saving expensive standards & accelerators.

CARBON & SULFUR (CS - 2020) DETERMINATOR

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Specifications

Dynamic Range (Weight Dependent)
Carbon 0.0001% to 6.0%(Extendable up to 99.999% OSR)
Sulfur 0.0001% to 1.5%(Extendable up to 99.999% OSR)

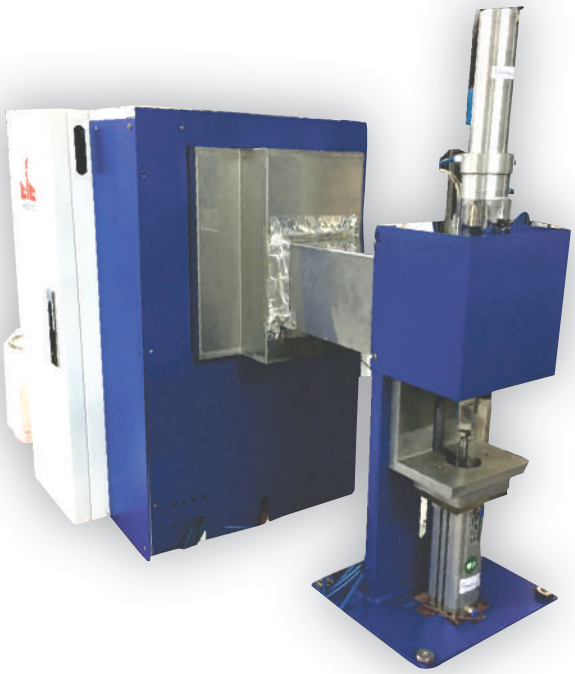
Precision
± 1% RSD of the range for C
± 1.5% RSD of the range for S

Readability
0.1 PPM or 0.00001 %

Sample size
Maximum Sample Size : 1.5 gms + 2.5 gms Accelerator
Nominal Sample size : 0.5 gms + 1.5 gms Accelerator
Minimum Sample Size : 10~ 20 mg

Detection Method
High Flow Low Volume Micro NDIR for Carbon
High Flow Low Volume Micro NDIR for Sulfur

Time
Analysis time : 25 ~ 60 seconds, Nominal 35 seconds



Glove Box Adaptation For Nuclear Applications

Glove Box Adaptation for Nuclear Applications

Gas Required Carrier Gas : Oxygen 99.95 % pure
Pneumatic Gas : Oxygen or N2 or Ar

Chemical Reagents
Anhydrone & fluxing/fusing agents

Induction Furnace
Upper : Fixed
Bottom : Movable
Current Control : Closed Loop Current Control

TRANSFORMER
2.2 KVA with 20 Mhz frequency

ELECTRICAL
Input Voltage : 230 VAC stabilized supply free from harmonic distortion. It is recommended to install a 6 KW line conditioner / stabilizer in case of erratic supply.

If you require anything that you don't see here please contact us for special system features and customized requirements.

ABOUT THE COMPANY

Baroda 1972

Baroda 1980

Solan 1993

Training Hall

Since 1972, Chromatography & Instruments Co. (CIC) has been serving the Indian Industry, Research Institutions and the Academia by offering high quality Analytical Instruments like Gas Chromatograph, Process Gas Chromatograph, TOGA, DGA, On line GC, Determinators & other similar systems.

CIC is having it's own Research & Development (R&D) Center recognized by the Department of Science and Technology, Government of India since 1983 apart from having its own well equipped Chromatography Training Institute, where training is imparted to the users of our products.

Our products are now exported to the USA, Saudi Arabia, Caribbean, Afghanistan and Africa. We are looking to increase our market presence in the domestic as well as international market for which we are always on lookout for competent channel partners who have the feel of the market pulse.

Our systems are designed & manufactured to satisfy the demanding needs for accurate & precise analysis. As a company we have 3 verticals - Manufacturing of Analytical Instruments, Channel Partners for GE for M&D products used in Generation & Transmission of electricity & Real Estate.

Aside from offering you the best value in the market today our commitment to our customer towards service and technical support has always been and remains of paramount importance to the company. Our guarantee of satisfaction means you can be confident that our products and services will be of the highest quality.

MD Office

Finished Goods Stock

The Elephant Gate - 1975

QA Hall

Testing Hall

Stock

Process Online GC

GC with Auto Sampler

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