SHANGHAI KEGUO

introducing the **HCS-500 HF**

Affordable, high precision, ultrafast simultaneous Carbon & Sulfur Analyzer

Combustion method with HF induction furnace and infrared detection

- Fully programmable furnace power, ceramic HF tube (3.5 kW @ 20 MHz), plate & grid current monitoring
- High-end NDIR detection system and data processing enables quantification from sub ppm to high percent levels
- Automatic furnace cleaning system
- Easy to operate but powerful Win7 based software

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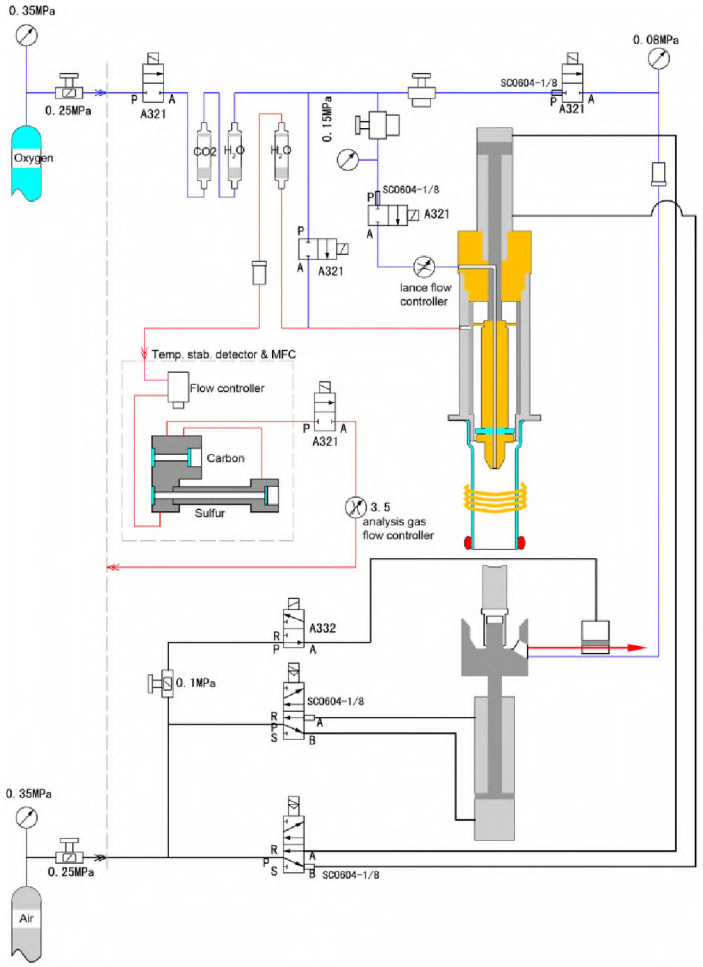

- Optimized flow design with multiple Oxygen supplies to achieve shortest analysis times (≤ 40 s; 20-30 s typical)
- Lance flow with soft-start functionality to avoid blowing away light sample particles
- High quality components for reliable operation
  (analytical grade solenoid valves with Ni-plated bodies, flow & pressure controllers, pneumatics and full metal connectors)
- Active heated and temperature stabilized dust filter for stable sulfur results
- Long reagent tubes provide high efficient purification and flexibility

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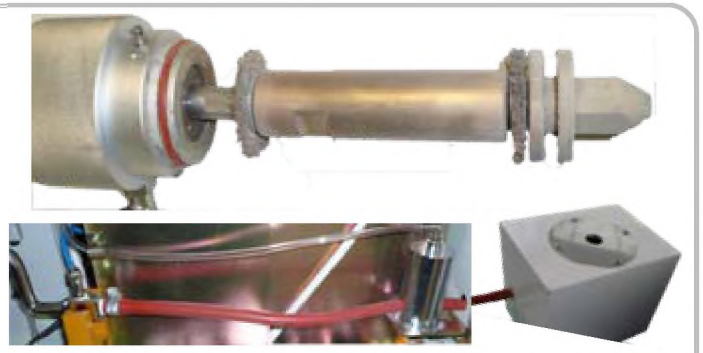

Lance with double brush & protectors (top), dust removal tube with external dust box (bottom)

Easy accessible reagent tubes and flow/pressure adjustment

Heated dust filter & furnace head

- Simple and effective dust removal and collection system: Purge flow transports loose dust into a dust box after every analysis without the need for a vacuum system
- Efficient cleaning of dust filter and combustion tube from sticking particles by double brushes
- Automatic cleaning by a push of a button (programmable strokes)
- Oil-free & rugged pneumatic cylinders to achieve perfect sealing and reliability
- Analysis gas flow within inert PTFE tubes to avoid carry-over

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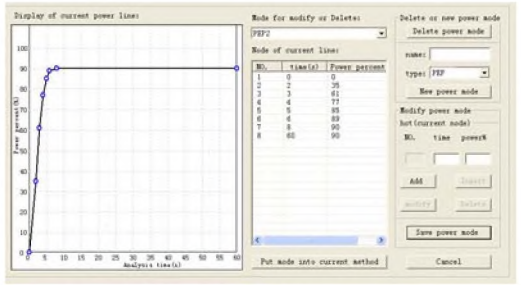
Advanced 2.5 kW HF Generator with ceramic tube (3.5 kW rating), grid & plate current monitoring



Fully programmable power curves (left) enable sophisticated applications like analyzing trace amounts of sulfur in copper where a melt without dust generation is key (right)

- HF-generator with long-life ceramic oscillator tube (> 3 yr.)
- High power (2.5 kW) generator operating @ 20 MHz
- Grid- and plate-current monitoring
  (verify coupling/combustion efficiency)
- HF-Power output programmable
  (Enables wide range of applications, minimize splattering and dust generation)
- Forced air cooling by Temperature regulated, reliable AC-fans
- High voltage components are well insulated and installed within secured RF-shielded enclosures

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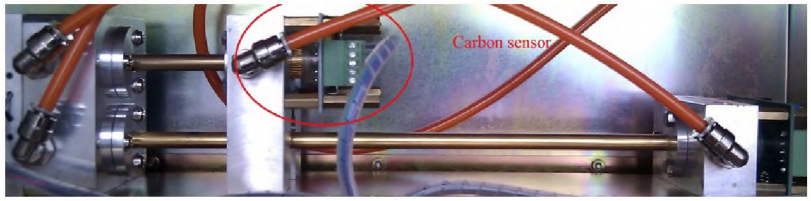
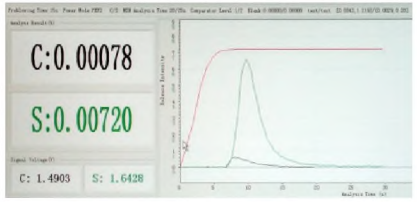
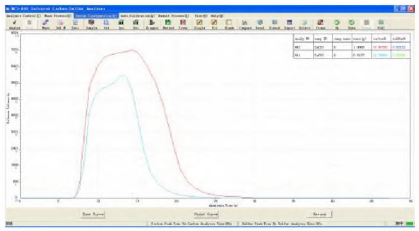


High efficiency micro-infrared light sources, advanced pyro-electric sensors and interference filters guarantee selective detection with lowest detection limits





Due to state of the art components and advanced linearization algorithm, the detection system provides an unmatched linear dynamic range from sub ppm up to 100%

Top: low alloyed steel with 8 ppm carbon
Bottom: 0.5g and 1g of $CaCO_3$ (12% carbon)

- Using high efficient, long-life micro infrared light sources, advanced pyro-electric sensors and narrow band interference filters
  (For highest S/N ratio, sensitivity, selectivity and stability)
- Gold plated flow cells with CaF_2 windows; source & detector isolated
  (Superior light throughput, corrosive media resistance and thermal stability)
- High data rate (80 Hz) with true 24bit resolution
  (Evaluates even the transient edges of sharp peaks with high accuracy)
- High reliable, military grade power supplies for precise supply voltages to source and detector

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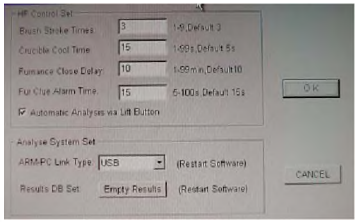
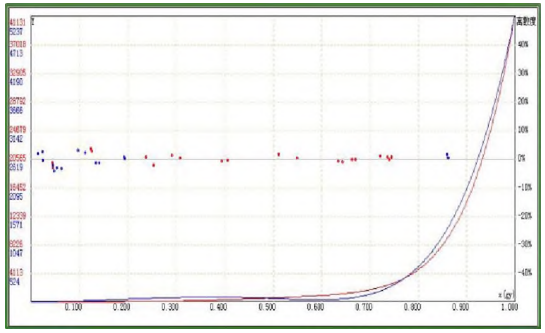


An embedded PC with ARM 9 CPU & integrated AD converter (top) provides high performance data processing and choice between communication protocols (bottom)



Iterative non-linear fitting algorithm to achieve full range linearity; unique for each instrument

- Fast, precise and reliable 24bit AD chip; FPGA chip technology
  (Highest resolution and speed; easily expandable due to FPGA technology)
- Latest ARM 9 CPU technology
  (Fast, affordable and power efficient CPU system)
- Integrated USB 2.0 and Ethernet (LAN) communication
  (Control and communication via USB or LAN cable, user selectable)
- Advanced linearization covers the full range, from ppm to 100% level with a single detector channel

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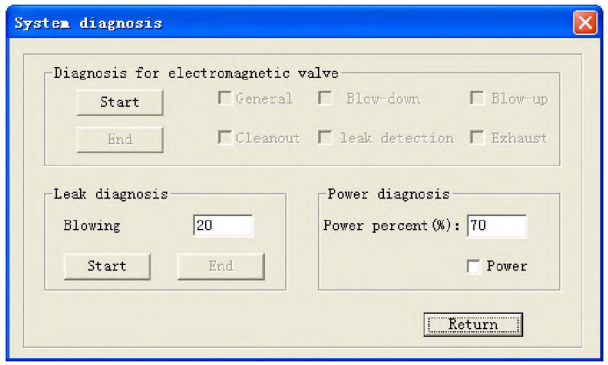
introducing the **HCS-500 HF**



For system diagnostic every solenoid valve can be toggled individually. Integrated leak test (pressure drop monitored by operator) and HF-generator test mode are available

Advanced security features

- Visual & acoustic notification before furnace lift closes when entering standby mode (timing & notification type user adjustable)
- Secure, non harmful actuation of the furnace lift
- Interlocks prevent operation with open covers or side panels
- Bullet-proof shutdown sequence when security circuit is engaged
- Dangerous components are placed in isolated compartments, sealed by tamper resistant screws

- Monitoring of essential parameters like pressures, flows & and furnace current
- System diagnostic & integrated leak test by software
  (Leak isolation and detection easily carried out by operator)
- Automatic Zero of balance & mass transfer
  (Software adjustable auto-zero by crucible placement, automatic of sample mass transfer available with MT balances)
- Analysis start via button or software
- Well arranged components
  (convenient access to reagent tubes, combustion tube and wearing parts for easy inspection & maintenance)

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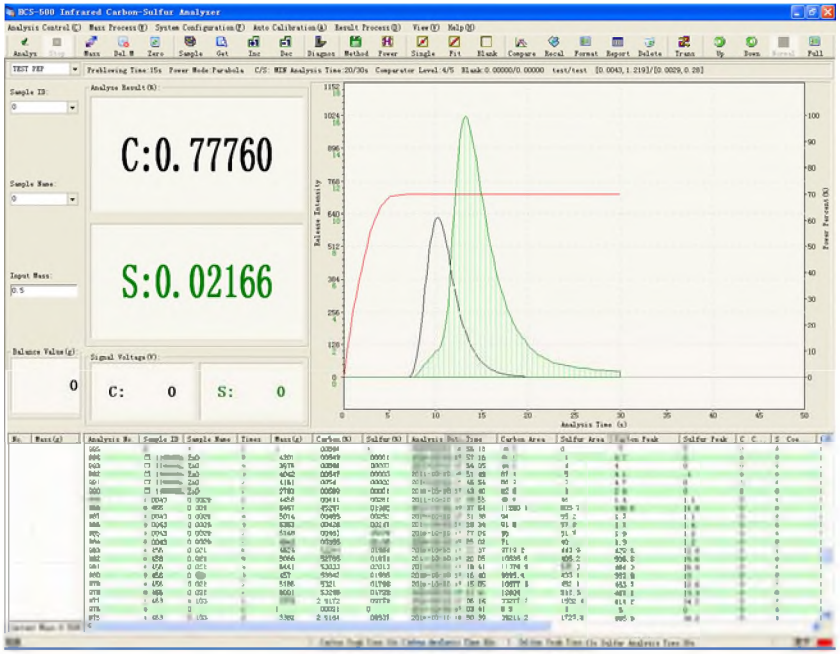

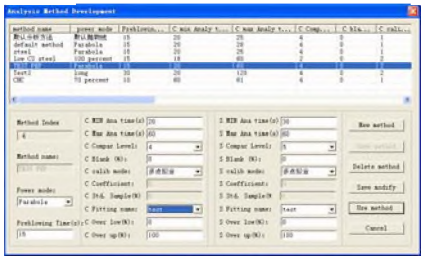

- User-friendly, fully configurable Windows based software
  (column headings, colors, curves, etc.)
- Existing calibrations & power curves can easily be assigned to individual methods
- Pioneering unique multi-interval multi-point linear fitting calibration
  (as well as standard calibration types, drift & blank correction, recalculation, multi-curve overlay)
- Integrated sample template & report configuration
- Flexible data processing, reporting, exporting and storage options
- and much more …

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Instrument Range (@ 1g):
Carbon: 0.2 ppm to 15 %
Sulfur: 0.2 ppm to 5 %
(both expandable to 99.99 %)

Precision (repeatability)[1]:
C: 0.3 ppm or 0.5 %RSD
S: 0.3 ppm or 0.5 %RSD
[1] whichever is greater (blank value limited for trace amounts)

Resolution/Sensitivity:
0.1 ppm

Error:
conform to ISO 9556-94

Detection Principle:
Solid-state infrared absorption

Analysis Time:
20 – 40 s (automatic)

Carrier Gas Consumption:
3.5 lpm, none during standby

Gas Requirements (@ 0.3 MPa)**:**
Carrier gas: Oxygen 99.5% [2]
Pneumatic: Air, Nitrogen or Argon[3]

[2] Higher purity or opt. gas pre-cleaning unit recommended for trace analysis
[3] Must be oil, water & particle free

Furnace:
HF-induction type, 20 MHz, 2.5 kW

Electrical Power Requirements:
230 VAC (±10%), 50/60 Hz,
single phase (ground required), 16A,
(IEC-type detachable power chord)