pg instruments

analytical instruments for science

pg SPARK
CCD Metal Analyser

The PG Spark CCD Metal nalyser is widely used for quality control in the production process and finished product in the metallurgical fields of casting, machinery and metal processing. PG Spark can be used for chemical composition analysis of:

- *Irons and Steels*
- *Aluminium*
- *Copper*
- *Nickel*
- *Colbalt*
- *Magnesium*
- *Titanium*
- *Zinc*
- *Lead*
- *Silver*
- *Other metal alloys*

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PG Spark
CCD Metal Analyser

PG Instruments – a leader in the development of first class scientific instruments – is pleased to introduce its brand new PG Spark.
The PG Spark instrument offers a full-digital solid-state light source with excitation energy and a continuously adjustable frequency making it suitable for analysing a variety of materials.

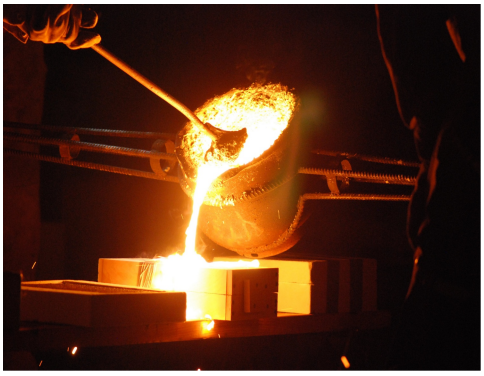
Introduction

PG Spark CCD Optical Emission Spectrometer uses a high-resolution linear CCD to perform full-spectrum scanning from 130-900nm. The PG Spark also benefits from an intelligent argon controlled flushed spectrometer chamber system thus ensuring maximum stability for long periods of analysis and the use of analytical wavelengths without constraint. This includes analysis for elements such as Carbon, Nitrogen, Sulphur, Arsenic, Boron and Phosphorus at ultra-low levels.

Features & Functions

Key Applications

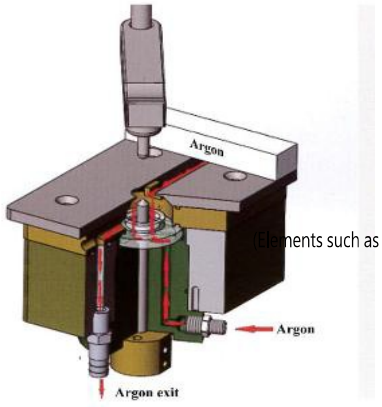
- Large Steel Plants approximatly 10ppm for elements such as C, N, Cr, S, P
- Pure Metal applications for metals such as Al, Cu, Pb, Zn, Mg, Ti etc.
- Testing Laboratories, Commercial Labs, Small Foundries etc.
- Regulatory compliance for low limits of detection such as Pb, As, Cd.
- Foundries needing a fast, accurate and precise analysis from materials in the production furnaces.
- Analysis of non ferrous alloys such as Al, Pb, Cu, Sn, Ti, Ag etc.
- Warehouse material identification.
- Manufacturing facilities.



Metal Foundry

Spark Stand

The spark stand will take a maximum weight of 50Kg of sample.
The specifically designed coaxial stand has an optimized internal gas circuit which greatly reduces argon consumption.
The sample cavity is cleaned by a Self Purging Function.



(Elements such as N, Li, Na

Spark Stand Schematic

Spectrometer with CCD and Channel Electronics

Spark Excitation Source

- Discharge parameters protected by passwords
- Maximum discharge frequency - 1000Hz
- Maximum time before adjustment is 5000hours
- Self-purging function keeping the cavity cleen
- Newly designed co - axial spark stand with an optimized internal gas circuit which greatly reduces argon consumption.

Optical System

- Paschen Runge Mounted Spectrometer
- Spectral Range 130-800nm
- Focal Length of Spectrometer is 500mm
- Holographic Grating with 2700 lines/mm Elements such as N, Li, Na and K can be analysed
- Holographic Grating with 2700 lines/mm
- Dispersion in the First Order is 0.74nm/mm and 0.37nm/mm in the Second Order
- Resolution: 0.006nm
- Detector with Multiple CCD,s
- Constant Temperature System with a control accuracy of +/- 0.1C

CCD Detector

- High Resolution CCD Detector
- 3648 Single Chip CCD Pixels
- Single Pixel size of 8um

Elemental Analysis Ranges achieved for some Common Materials

Fe BASED MATERIALS	RANGE %	Al BASED MATERIALS	RANGE %	Cu BASED MATERIALS	RANGE %
C	0.0015-4.5	Cd	0.001-0.05	Al	0.005-11.2
Si	0.0017-6.0	Cr	0.001-0.5	As	0.005-0.4
Mn	0.0007-25	Cu	0.001-21	Be	0.1-3.5
P	0.0018-1.5	Fe	0.001-2.25	Bi	0.005-0.1
S	0.003-0.4	Mg	0.001-15	Cd	0.0005-0.05
Cr	0.005-40	Mn	0.001-7	Co	0.0005-0.2
Ni	0.005-40	Ni	0.001-3	Fe	0.005-6.1
Mo	0.001-11	P	0.001-0.02	Mg	0.005-0.065
Cu	0.005-10	Pb	0.001-1.1	Mn	0.005-6
W	0.006-25	Si	0.001-27	Ni	0.005-35
V	0.005-10	Sn	0.001-0.35	P	0.005-0.1
Ti	0.003-2.0	Ti	0.001-0.5	Pb	0.005-10
Nb	0.006-3	Zn	0.001-11	S	0.0005-0.1
Al	0.004-6	Sb	0.005-0.5	Sb	0.005-0.5
Mg	0.001-0.15	Sr	0.005-0.1	Si	0.005-5
Ce	0.003-0.2	V	0.005-0.3	Sn	0.005-12
Zr	0.001-0.5	Zr	0.001-0.5	Ti	0.005-0.3
Co	0.001-13	Ag	0.005-0.8	Zn	0.005-40
B	0.003-0.1	As	0.003-0.05	Cr	0.005-0.1
La	0.003-0.1	B	0.001-0.015	Zr	0.005-0.01
As	0.001-0.2	Be	0.001-0.2	Te	0.0005-0.1
Pb	0.001-0.4	Ca	0.005-0.2	Se	0.0005-0.1
Sn	0.001-0.3	Ce	0.005-0.2	In	0.005-0.1
Sb	0.005-0.2	Ga	0.005-0.1	C	0.005-0.05
Bi	0.001-0.2	Co	0.005-0.57	B	0.005-0.02
Ca	0.001-0.01	Li	0.005-0.05	Au	0.005-0.1
Zn	0.001-0.05	Na	0.005-0.02	Ag	0.005-0.1
Se	0.003-0.4	Al	REF	Cu	REF
N	0.05-1.0				
Fe	REF				

Spectrometer Argon Flush

The Spectrometer Optical Chamber is a NEW optical chamber with an extremely low thermal expansion coefficient which provides high instrument stability

The argon flush to the Spectrometer chamber is programmed and controlled via the software.

The warm-up time for a cold instrument which has been shut down for 12 hours or more is only 30 minutes. For a system in constant operation the start up time is 5 minutes or less.

Argon Consumption

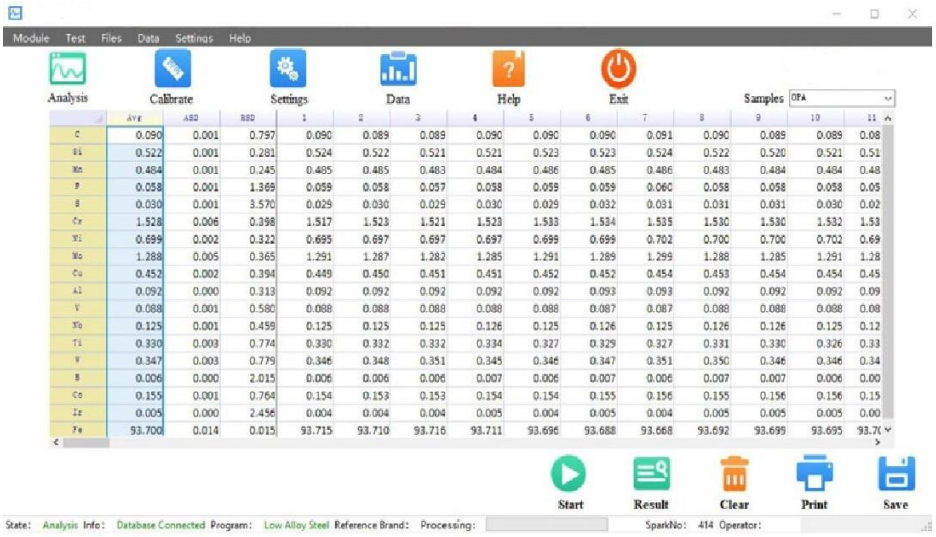
- Argon Flow rate during analysis is under 8 l/min
- Argon Flow during standby is 60 ml/min
- The gas flow, pressure and rate of flow are all programmed via the software

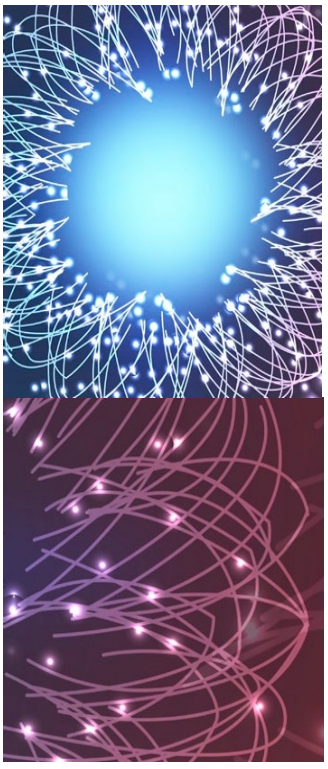
Data Acquisition and Communication

- Net Based, port data acquisition for stable data transmission and easy configuration.
- Multi-Thread data acquisition to improve the stability of the software and data reliability
- Variety of communication modes to meet different user requirements.

Software

- User-friendly English language based software (other languages available)
- Calculation of the same element from various matrices with different calibration curves is available
- Support for automatic calculation functions, such as Carbon Equivalent, is standard in the software.
- Material Identification comparing stored analytical data, calibrations and curves.
- Re-calibration using a minimum of one single sample is possible





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Specifications

Optical System

Grating	*Holographic 2700 lines/mm*
Dispersion	*1st order: 0.74nm/mm 2nd order: 0.37nm/mm*
Focal Length	*500mm*
Temperature Control	*+/-0.1˚C*
Detector	*Multiple CCD (Charged Coupled Device)*
Pixel Size	*8µm x 8µm*
Detector Pixels	*1024 x 1024 pixels*
Wavelength Range	*130nm - 800nm*
Resolution	*0.006nm*

Spark Stand

Maximum sample Weight	*50Kg*
Max Discharge Frequency	*1000Hg*
Purge Gas	*Argon 99.999%*
Gas Consumption	*Programmable, Ultra Low Standby flow 60ml/min*
Dicharge Parameter	*Protected by password*

Software

Operating Software	*Spark-Win Software*
Computer	*PC, Windows 10 system and monitor*
Communication Port	*USB, RS232, Ethernet TCP/IP*

Environment

Operating Temperature	*10 - 40˚C*
Operating Humidity	*Less Than 75%*

Dimensions	*470(W) x 840(L) x 440(H) mm*
Weight	*80Kg*
Voltage (Stabilised)	*240V +/-10% 50Hz 16A*

We reserve the right to modify, revise/upgrade, suspend or discontinue any Product in whole or in part, either temporarily or permanently, with or without notice.

The highly qualified and long experienced team at PG Instruments Ltd are recognised experts in Spectroscopy, Electrochemistry and Relevant Technologies. They have been developing and manufacturing analytical instruments for science for over a decade and have a worldwide recognised reputation for excellence in their field.

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