KD5 Spark OES Analyzer

1. Product Introduction

The KD5 type spark direct reading spectrometer uses international standard design and manufacturing process technology. also uses the most advanced CMOS signal acquisition components of Japan's Hamamatsu Company. Each CMOS can be set separately to the number of sparks, synchronized with the first-class international spectrometer

technology, and adopts a vacuum light chamber design and a fully digital excitation light source. This CMOS spectrometer not only contains the full spectrum characteristics of the CCD spectrometer, but also has the advantages of PMT spectrometer's extremely low detection limit for non-metallic elements, reasonable design of the whole machine, simple operation and easy to learn, accurate data and good long-term stability.

2. Main technical parameters

Application Areas	Various analysis in the metallurgy, casting, machinery, scientific research, commodity inspection, automobile, petrochemical, shipbuilding, electricity, aviation, nuclear power, metal and nonferrous smelting, processing and recycling industries.
Detectable substrate	Fe, Al, Cu, Ni, Mg, Co, Zn, Pb, Ti
Optical system	Pa-Longge Roland Circle Full Spectrum Vacuum Optical System
Wavelength range	140~680nm
Grating focal	401mm

length	
Detectors	High-performance CMOS arrays
Light source type	Digital light source, high energy pre-combustion technology (HEPS)
Discharge frequency	100-1000Hz
Discharge current	Maximum 400A
Working power supply	AC220V 50/60Hz 1200W
Instrument size	780*565*360mm
Instrument weight	approximately 78kg
Test time	depends on the sample type, generally around 20S
Electrode type	Tungsten spray electrode
Analysis gap	4mm
Other functions	Vacuum, temperature, software automatic pressure control, communication monitoring

3. Main technical characteristics

High-performance optical system	The arc flame generated during excitation of the optical system is directly directed into the vacuum optical chamber by the lens, realizing direct optical path through and effectively reducing optical path loss;
	High-precision CMOS components can accurately determine the content of non-metallic elements such as C, P, S, As, B, N and various metal elements;
	The measurement results are accurate, with excellent repeatability and long-term stability.
Automatic optical path calibration	Automatic optical path calibration, and the optical system automatically performs spectral line scanning to ensure the correctness of reception and avoid tedious peak scanning work;
	The instrument automatically recognizes the specific spectral line and compares it with the original storage line, determines the drift position, and finds out the current pixel position of the analysis line for measurement.

Plug-out lens design	The vacuum optical system adopts a unique incident window and is isolated from the vacuum, and can be operated in the working state of the vacuum system. The optical lens adopts a plug-in lens structure, making daily cleaning and maintenance convenient and fast.
Vacuum chamber integration	The unique optical chamber structure design makes the vacuum chamber smaller in volume, and the vacuum time is only 1/2 of that of ordinary spectrometers;
	The integrated design of vacuum chamber and high-precision processing make the vacuum lasting longer.
Vacuum oil prevention technology	Multi-stage isolation vacuum oil-return technology, using vacuum differential pressure valve to ensure that the vacuum light chamber is completely isolated from the vacuum when the vacuum pump is not working
	A vacuum oil filter device is added in the middle to ensure that the oil in the vacuum pump does not enter the vacuum chamber and ensure that the CMOS detector and optical components work in a reliable

	environment.
Open excitation station	The flexible sample clip design of the open excitation machine is designed to meet sample analysis of various shapes and sizes on the customer site;
	When using small sample fixtures, the minimum analysis of wire can reach 3mm.
Jet electrode technology	Adopting the most word-advanced jet electrode technology, using tungsten electrode material electrodes, in the excitation state, an argon jet air flow will form around the electrode, so that during the excitation process, the excitation point will not come into contact with external air, improving the excitation accuracy.
	With the unique argon gas circuit design, it greatly reduces the use of argon gas and also reduces the cost of customers.
Integrated gas circuit module	The gas circuit system adopts a maintenance-free design of gas circuit modules, replacing solenoid valves and flowmeters, and the electrode self-purging function creates a good environment for excitation.
Digital excitation	Digital excitation light source, using the most

light source	advanced plasma excitation light source in the world, super stable energy is released in the argon environment to excite samples;
	Fully digital excitation pulses ensure ultra-high resolution and high stability output of plasma excitation;
	The various parameters of the light source can be adjusted arbitrarily to meet the excitation requirements of various different materials.
High-speed data collection	The instrument adopts high-performance CMOS detection components, which have the function of individual ultra-high-speed data acquisition and analysis of each CMOS, and can automatically and real-time monitoring and control the operating status of modules such as light chamber temperature, vacuum degree, argon pressure, light source, excitation chamber, etc.
Ethernet data transmission	The computer and the spectrometer use Ethernet card and TCP/IP protocol to avoid the disadvantages of electromagnetic interference and fiber aging. At the same time, the computer and printer are completely external, making it easier to upgrade and replace;

	The instrument status can be monitored remotely, and the multi-channel control system can control and monitor all instrument parameters.
Prefabricated working curve	It has a standard sample library of different materials and grades, and the factory prefabricated working curve when the instrument leaves the factory, which is convenient for installation and commissioning and timely put into production;
	There are slight differences according to the analysis procedures corresponding to the elements and materials. The excitation and testing parameters have been adjusted when they leave the factory. The optimal testing conditions can be automatically selected according to the analysis procedures;
	The technical specifications include an analysis scope (and the working curve can be drawn or extended for free according to the standard samples provided by the user).
Fast analysis speed	The analysis is fast and can be completed in just 20 seconds;
	For different analytical materials, the pre-ignition time

	and measurement time are set to enable the instrument to achieve the optimal analytical effect in the shortest time.
Multi-matrix analysis	The optical path design adopts a Roland circular structure, and the detectors are arranged alternately up and down to ensure that all spectral lines are received and that multi-matrix analysis can be realized without adding hardware facilities;
	It is convenient to increase matrix, material types and analytical elements according to production needs (no hardware cost).
Software Chinese and English system	The instrument operation software is fully compatible with Windows 7/8/10 system;
	The software is simple to operate, even if people without any spectrometer knowledge and operation experience only need to go through simple knowledge training.

4. Technical configuration

1) Specifications and technical parameters

Project	Indicators
Testing substrate	Fe matrix alloy composition measurement
Test time	The type of sample is usually around 30 seconds
Optical system	Pa-Longge
Wavelength range	140~680nm
Working power supply	(220±20) V AC, (50±1) Hz, single-phase power supply with protective grounding
Working temperature	(10~30)℃
Storage temperature	(0～45)℃
Working humidity	20%~80%
Argon purity requirements	99.999%
Argon inlet pressure	0.5MPa
Argon flow rate	The excitation flow rate is about 3.5L/min, the maintenance flow rate is about 0.4L/min, and the standby flow rate is about 0.1L/min.
Dimensions	726mm long, 565mm wide, 380mm high

Weight	about 78kg
Excitation maximum power	400VA
Average standby power	100VA
Light source type	Pulse synthesis full digital light source (programmable pulse full digital light source)
Discharge frequency	maximum 1000 Hz
Discharge current	maximum 400A
Ignition ignition pulse	1~14kV
Spark excitation pulse	20~230V
Arc excitation pulse	20~60V
Excitation table aperture	12mm

2) Optical system

Full-spectrum optical system with Pa-Longge structure

Maximum wavelength range (140~680) nm

Multiple high-performance CMOS detectors

Resistant to ambient temperature changes

Integrated optical chamber design, CMOS detector ensures optimal short-wave performance

Constant temperature control of the light room, constant temperature is 36℃

3) Sample excitation station

The special design of the excitation room makes the cleaning of the sample room/excitation room more convenient;

The optimized argon gas circuit design ensures effective cooling of the excitation table and the metal dust generated during the excitation process to effectively enter the filter; makes the sample excitation more stable, and greatly reduces the human body's intake of metal dust, which is conducive to protecting the health and safety of operators;

Smaller excitation space makes argon consume less;

Easy-to-use sample fixture

It has electrode self-purging function, making the electrode life longer and easier to clean the electrode

The excitation pore size of 13 mm is more conducive to sample analysis

The open sample excitation table can adapt to the analysis of samples of various sizes and more shapes;

The structural design of the lens part makes it easier to disassemble and wipe the lens, and the argon flushing design can extend the lens cleaning cycle.

4) Digital light source

Pulse synthesis of all digital light sources (programmable pulsed all digital light sources), with a maximum frequency of up to 1000Hz;

High Energy Predictive Technology (HEPS);

Optimized design of control and power circuits, perfect excitation safety protection function

Provides the best spark, arc or combined excitation waveform for different analytical targets

Frequency: (100~1000) Hz

Discharge current: maximum 400 A

5) Data acquisition system

High-performance DSP processor with ultra-high-speed data acquisition and control functions

Single spark acquisition and spectral delay acquisition to achieve more optimized element content measurement

External computer (user's choice)

High-speed Ethernet data transmission

6) Analysis software

Graphical analysis software based on Windows operating system, convenient and practical;

Complete automatic system diagnostic function

Complete database management functions, which can facilitate query and summarize data

Intelligent calibration algorithm to ensure the stability and reliability of the instrument

Complete spectrum line information and interference deduction algorithm to ensure more accurate instrument analysis

Adapt to the latest Windows operating systems