

Optical Emission Spectrometer

1. Brief Introduction

CX-9800 spectrometer is designed for industrial analytical laboratories of mechanical engineering, metallurgical and metal processing factories.

Spectrometer is capable to replace a whole laboratory for identification chemical composition of metals and alloys, significantly affecting the quality of products.

CX-9800 represents the best solution for customers who need speed, high technical characteristics, reliability and high accuracy of the determination of the total elemental composition of metal.



CX-9800T we quoted



CX-9800L with stand

2. Main Specification

CX-9800 spectrometer can be used in the quantitative analysis of solid metal samples and grade identification. Optical system with CCD detector, spectral range covers all typical materials. Instruments equipped with argon flush spark machine, open design spark stand is suitable for the analysis of samples with different shapes and sizes.

- Panchen-Runge Mount Structure, Rowland circle optical system.
- Diameter of Rowland circle: 400mm
- Wavelength Range: 130 – 800 nm
- Detector: Multi high resolution CCD detector
- Optical chamber temperature: Temperature auto control: $34^{\circ}\text{C}\pm 0.5^{\circ}\text{C}$
- Pixel Resolution: 30pm
- Optical grating groove: 3600 l/mm
- Level One spectral dispersive power: 1.2 nm/mm
- External Incident window, convenient cleaning and replacement
- Excellent drift correction, thanks to automatic peak-finding(accuracy of 0.1 pixels)
- Excellent UV sensitivity, thanks to the new improved vacuum technology

Digital plasma Generator

- All-digital plasma spark source technology
- High efficiency thanks to compact design and semiconductor control technology
- High-energy pre-combustion technology (HEPS)
- Excitation parameters can be user-defined by the user according to the actual needs
- Frequency 100 - 1000Hz
- Current 1-80A
- Parameters adjustment may need to adjust the components

Optimized sample stage

- The open sample stage design can meet analysis of large sample requirements.
- 3.4mm analysis gap of sample stage
- "Spray electrode" technology can easily deal with small samples and complex geometric shape samples
- low argon consumption, standby: no standby flow
- Universal adjustable sample adapter
- Different matrix can be easily replaced the corresponding spark stand
- Optimized impurity discharge system
- Excellent heat dissipation thanks to robust cooper sample stage

Sizes

- Benchtop Model High: 460mm,Length: 830mm, Width: 700mm, Weight: 85 kg

Argon Requirements

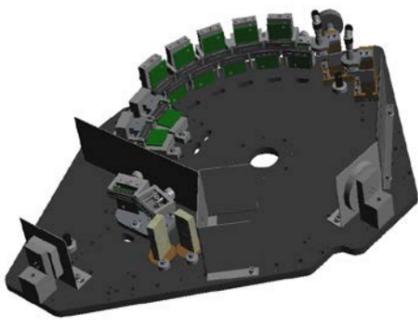
- Pure argon, 99.999%; argon valve (specifically with pressure reducing valve)
- Air pressure > 4MPa; export equipment pressure 0.5MPa
- Copper transmission

3. Technology Characteristics of CX-9800 Spectrometer



1. With its high-performance and reliable design, as well as innovative optical systems and extended wavelength ranges, the CX-9800 direct-reading spectrometer ensures accurate identification and trace analysis of important elements with very low detection limits and excellent long-term stability. The results are accurate and reproducible. The combination of the leading CCD detector and digital readout technology makes the instrument overall design superior to the traditional photomultiplier tube technology, has gradually become the metal manufacturing, processing and casting industry of choice.

The wavelength of CX-9800 direct reading spectrometer is 130-800 nm which is in the optimal position no matter the high detection limit or the low detection limit



2. CX-9800 direct reading spectrometer introduces the newest optical system which represents the latest direct reading spectrometry technology of the digital age; it incorporates the newest CCD solid-state detector technology with 12 μm optimized pixel resolution, and the newest grating spectroscopy.

- Multiple linear array CCD as detector are introduced to the vacuum spectroscopic system which make it have 2400*8 pixels, can achieve full-spectrum analysis of the band received. Each element was analyzed by multiple lines, comprehensive output, dynamic range is large, the results are accurate. CCD detectors can meet the analysis of full spectral lines without missing, can analyze same elements using multiple lines at the same time, and automatically select the output.

According to the characteristic of plasma spectrum signal, in order to obtain the best observation angle for the best observation data, the imagine instruments is placed at a specific angle in the optical chamber. This design is unique in the CCD spectrum.

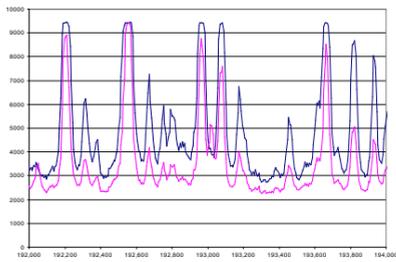
- CX-9800 spectrometer allows the instrument to perform ultra-low-UV spectrum (VUV) signal analysis by applying special materials to the direct optical path entrance window.



3. CX-9800 spectrometer with a new vacuum chamber system design, compared with the traditional argon-filled system, its advantages are enormous. First in the instrument non-working state does not require real-time room for argon purging, greatly reducing the use of argon, saving customers the cost of use. Second, the idea of the instrument's vacuum optical system to ensure that the instrument in the cold start (shutdown restart) state of 30 minutes to reach a stable working condition, while the traditional argon-type optical chamber system takes 1-2 hours to reach a stable working condition.

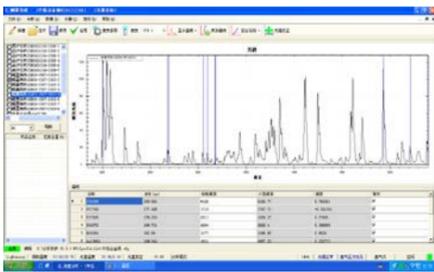
- In order to detect ultra-low UV spectral signals, as well-designed and stable performance of the vacuum system is very important. The vacuum system on the CX-9800 is operated with the latest generation of vacuum pumps with safety solenoid valves to maximize the safety of the vacuum system.

- The vacuum system of the CX-9800 can be loaded with vacuum according to the customer's specification. Through the work of software digital display, you can know the working status of the vacuum chamber.



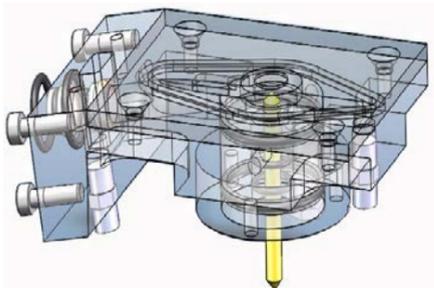
4. CX-9800 spectrometer in each excitation, the optical system automatically scan line to ensures that the accuracy of reception, exempt from tedious peak scanning.

- Full spectrum technology automatically adjusts the light path tracing, when doing the excitation, the instrument automatically identify each CCD on a particular line, compared with the original storage line, determine drift position, to find the current pixel position analysis line. CX-9800 can automatically eliminate the spectral drift due to temperature/pressure/vibration changes; and the traditional spectrum using photomultiplier technology must be manually fine-tuning which require high technical skills. Full-spectrum technology automatically and quickly addresses, to avoid the laborious manual operation, but also to avoid human error.



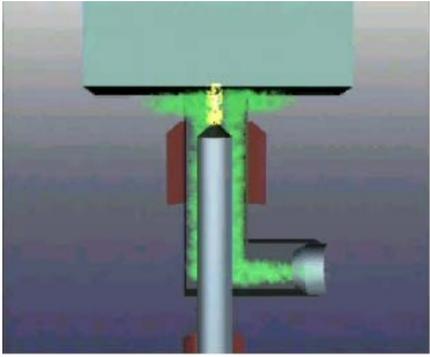
5. CX-9800 instrument is using full spectrum direct reading spectrometer (TSA) technology, it can be very convenient to add spectral lines and matrix without adding hardware, matrix analysis can be realized easily.

- Customer can ask to add analysis matrix according to actual needs in use process, the operation can be done very easily in customer place. Compared to the same kind of technology of the PMT spectrometer, it requires a wide range of hardware and it may not be able to be able to add customer required matrix or elements due to the initial instrument configuration limits.



6. New design was applied in CX-9800 spectrometer excitation stand, it was be optimized corresponding to new application requirements and also retained the advantages of the traditional excitation stand.

- Sealed design makes the structure of the excitation stand very strong, can ensure the stability of instrument under the condition of high temperature spark excitation.
- The change of structure design on the CX-9800 spectrometer excitation stand improved the jet of argon flow direction, greatly reducing the spark excitation residues, at the same time make the spark machine cleaning and maintenance also becomes simpler.
- The CX-9800 spectrometer retains the design of an open sample stage, simplifies sample placement and analysis, there is no special adjustment requirement other than the electrode gap, sample processing is simpler than the traditional spectrum.



7. CX-9800 spectrometer adapted a unique jet electrode technology (JET STREAM). In the excitation status, an argon gas jet is formed around the electrode. This technology will bring the following unique advantages.

- The argon flow around the excitation point ensures that the excitation process is free from external disturbances
- The use of argon gas is saved, which also reduces the cost of use for customers
- No need to seal the sample stage, wire and other small samples can also be analyzed very conveniently by using adapter.
- Pulling front cover makes the cleaning and maintenance of the excitation stand more convenient.



8. The CX-9800 spectrometer has a compact design for the incident light path. By connecting the incident light path directly to the vacuum system, the two lenses separate the entrance window from vacuum and dust protection, making maintenance easy and convenient for customers to carry out in their daily work.

- Compared with similar products, incident window is usually more complicated than the optical system design, makes the incident window cleaning need professional personnel to operate, improper operation may cause the vacuum system damaged.



9. New design of circuit system was introduced to CX-9800 spectrometer, and latest technology on read-out system and spark source were also applied in the instrument.

- The CX-9800 uses synchronous, real-time digital readout technology, which increases the stability of analysis time and data compared to traditional sequential readout techniques.
- CX-9800 spectrometer uses all-digital plasma spark source technology. All excitation parameters can be customized by the user through the user interface according to the actual needs of the set.
- Circuit system was separated completely with optical system in CX-9800 spectrometer, and it was placed in the outer part of the optical chamber in the instrument, such design makes the heat dissipation function of the instrument enhanced greatly, at the same time, the follow-up of the instrument is very convenient.



10. The operation software of CX-9800 spectrometer is very simply to learn, it is English menu. Any person even without any knowledge background of the spectrum can operate the software after been simply trained. Meanwhile, the design of the instrument reflects the people-oriented design concept, the use of the instrument and maintenance everywhere embodies humanistic care.

4. Programs mentioned above of CX-9800 (please refer to calibration list)

5. Main core components of CX-9800 spectrometer

No.	Item	Brand	Company or Origin
1	Linear array CCD	Toshiba	Japan
2	Optical grating	Zeiss	Germany
3	Optical lenses	Zeiss	Germany
4	Optical fiber	Agilent	USA
5	Slit	lenoxlaser	USA
6	Filter	TDK	Japan
7	Pressure sensor	SSI	Canada
8	Solenoid valve	Burkert	Germany
9	Light source module	CREATE	-
10	System control module	CREATE	-
11	Data collection module	CREATE	-
12	Vacuum optical module	CREATE	-
13	Excitation stand module	CREATE	-
14	Software	CREATE	-

6. Standard Configuration list for CX-9800 (T) Optical Emission Spectrometer

No.	ITEMS	UNIT	QTY	REMARK
1	CX-9800(T) Optical Emission Spectrometer (Vacuum)	PCS	1	
2	Analytical Base	PCS	9	
3	Analytical Curve	Pics	-	
4	Global Standardzation Std Sample	PCS	9	
5	Vacuum pump	PCS	1	
6	Baffle Valve	PCS	1	
7	Corrugated pipe	PCS	1	
8	Pneumatic pipe and fitting	m	2	
9	Oxygen pressure reducing valve and fitting	PCS	1	
10	Power wire	PCS	1	
11	Signal transmission wire	PCS	1	

12	Operation software	PCS	1	
13	User manual	PCS	1	
14	Qualified certificate	PCS	1	
15	Complete set packing list	PCS	1	
16	List of tools and spare parts	PCS	1	
17	Warranty Bill	PCS	1	
18	Delivery form for installation and acceptance	PCS	2	

7. Tools and Spare Parts list for CX-9800 Optical Emission Spectrometer (Vacuum)

No.	Part No.	ITEMS	UNIT	QTY	REMARK
1	CB-4	Electrode cleaning brush, 4mm	PCS	2	
2	ST-0034	Pole pitch ruler	PCS	1	
3	ST-0035	Long handle cross screwdriver	PCS	1	
4	ST-0036	Long handle flathead screwdriver	PCS	1	
5	AK-1	Socket head wrench Suit	PCS	1	
6	BS-011	Open Spanner 10*12	PCS	2	
7	SC-001	Hexagon socket countersunk head screws 6*8	PCS	4	
8	OR-068	O-Ring 68*2.65mm	PCS	1	
9	OR-035	O-Ring 35*2.65mm	PCS	2	
10	OR-025	O-Ring 25*1.80mm	PCS	2	
11	OR-013	O-Ring 13*1.80mm	PCS	2	
12	WF-25005	Fuze Wire(250V,5A)	PCS	2	
13	WF-25015	Fuze Wire(250V,5A)	PCS	2	
14	GN-606	Outlet(Big)	PCS	1	
15	GN-109	Outlet(small)	PCS	1	
16	FQ-011	Exhaust gas filtering tank and fitting	PCS	1	
17	FQ-012	Exhaust gas filter element	PCS	2	
18	FQ-013	Exhaust gas filter tube	m	1	
19	JP-1	Degreasing cotton	PCS	1	
20	KG-003	Vacuum Adaptor	PCS	1	
21	GL-001	Vacuum filter core	PCS	1	
22	KG-001	Hoop(KF25)	PCS	2	
23	KG-002	Hoop(KF16)	PCS	6	