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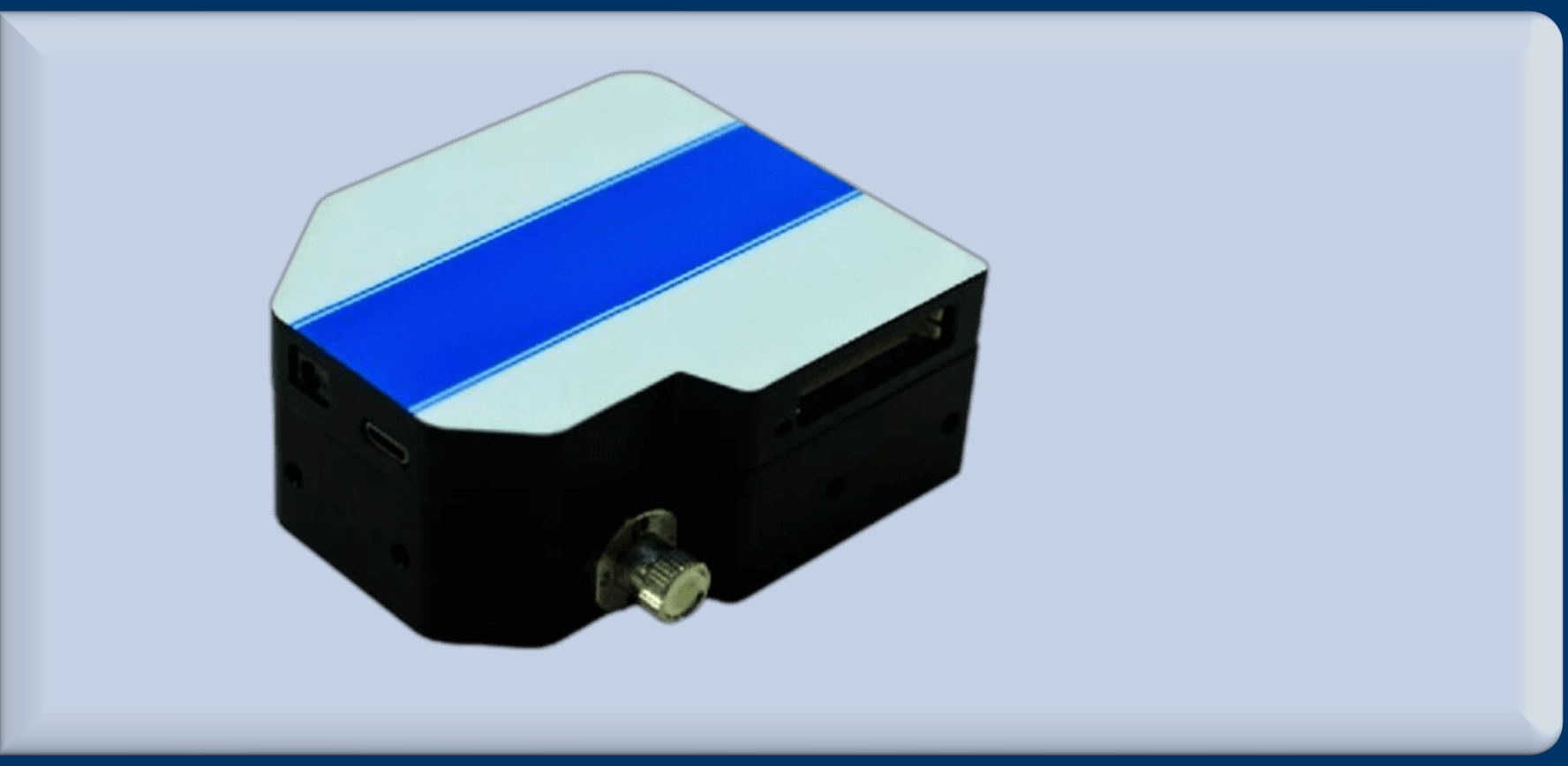
UltraSense 11K Spectrometer



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UltraSense 11K Spectrometer

Introduction

UltraSense 11K Spectrometer is a basic fiber optic spectrometer launched by Venuslab. Making it easy to deploy in space-constrained scenarios. Its spectral range is configurable (190-1100nm), and it is equipped with a 2048-pixel channel CCD detector. The fiber interface is Key-SMA905, supporting USB 2.0, RS232 communication interfaces, and a 24PIN extended function interface, which can realize the enabling, intensity control, and power feedback of the supporting light source. This product can meet various measurement scenarios such as color measurement, radiation measurement, absorption measurement, fluorescence spectroscopy, and Raman spectroscopy. It has a working temperature range of 0-40℃ and a humidity range of 20-85%, demonstrating good environmental adaptability.

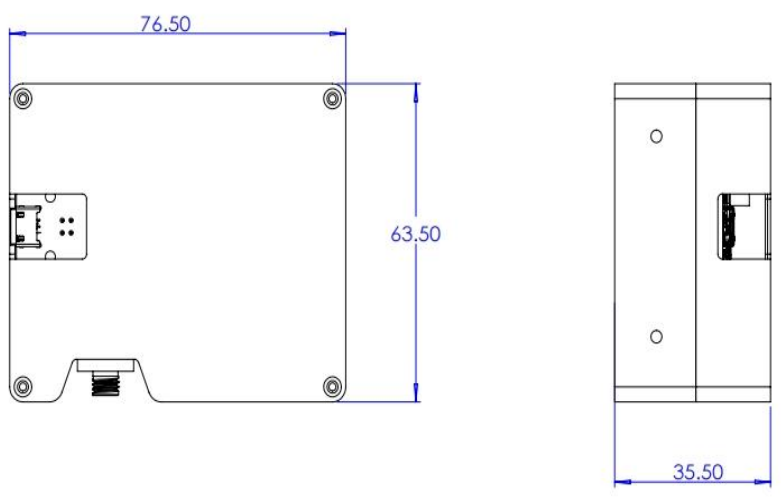
Features

- Compact and small structural design
- Configurable wide spectral range
- Excellent optical performance and stability
- Flexible optical fiber adaptation capability
- Rich interfaces and extended functions

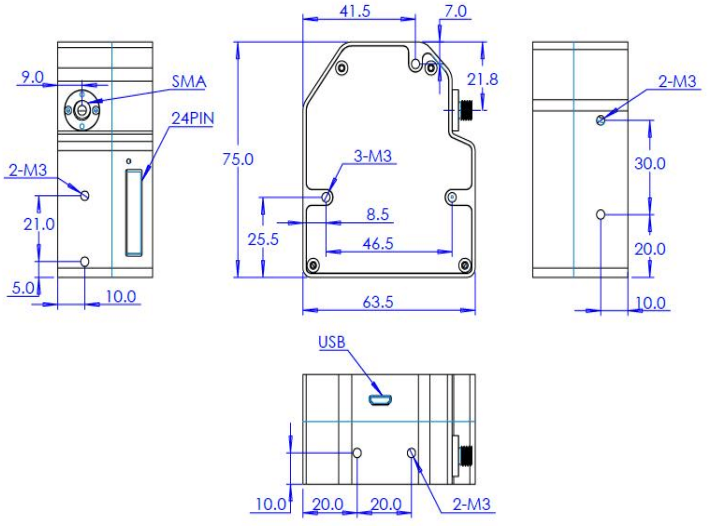
Applications

- Color Measurement & Industrial QC
- Radiation Measurement & Light Source Analysis
- Absorption Measurement & Concentration Analysis
- Fluorescence Spectroscopy & Food Safety
- Raman Spectroscopy & Material ID

Dimension



2D Dimension Drawing of VL11639-190-540



2D Dimension Drawings of Other Standard Models

UltraSense 11K Spectrometer

Common Parameter Specification Table

Category	Parameter	Value
Basic & Optical Parameters	**Product Model**	**UltraSense 11K Spectrometer**
	Optical Fiber Interface	Key-SMA905
	Pixel Channel Count	2048 pixels
	Stray Light	~0.3%
	Wavelength Temperature Drift	0.3 pixel/°C
	Fiber Insertion Consistency	≤7%
	Weight	190 g
	Dimension	75×63.5×35 mm
	Operating Temperature	0-40°C
	Operating Humidity	20-85%
Functional Parameters	**AD Sampling**	16 bit
	Data Interface	USB 2.0, RS232
	Extended Function Interface	24 PIN
	Acquisition Mode	Single, Continuous, Software Trigger, Synchronous External Trigger, Asynchronous Reset External Trigger
	Detector Integration Time	60 μs - 65 s
	CCD Readout Noise	≤30
	CCD Dynamic Range	3000:1
	Signal-to-Noise Ratio	380:1
	Response Linearity	≥98%

Notes:

- **CCD Readout Noise:** The root mean square (RMS) of CCD readout noise at the minimum integration time.
- **CCD Dynamic Range:** Dynamic range under the condition of minimum integration time, calculated as (saturation value - dark noise baseline) / standard deviation of CCD readout noise; the evaluation method refers to Haipu Enterprise Standard.
- **Response Linearity:** The response nonlinearity is before calibration.

UltraSense 11K Spectrometer

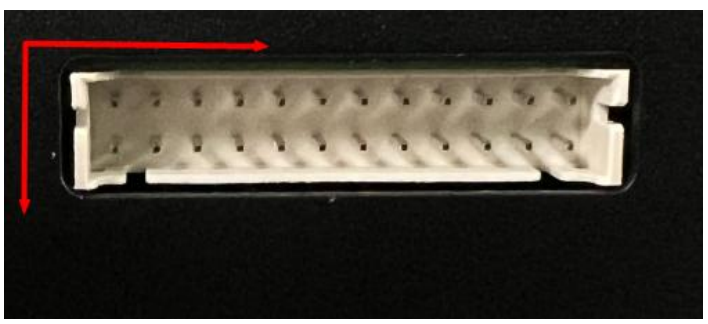
Interface Description

The figure below shows the various interfaces of the UltraSense 11K Spectrometer. The optical fiber interface is an SMA905 interface, which is used to connect sampling accessories such as reflective probes, transmission-reflection brackets, and liquid flow cells.

The Micro USB interface is used to connect to a computer via a data cable. The 2.0MM-24P interface (24-pin interface) is used for the secondary development of the spectrometer.

Wiring pin definition

24pin port uses 2.0MM-24Psocket.



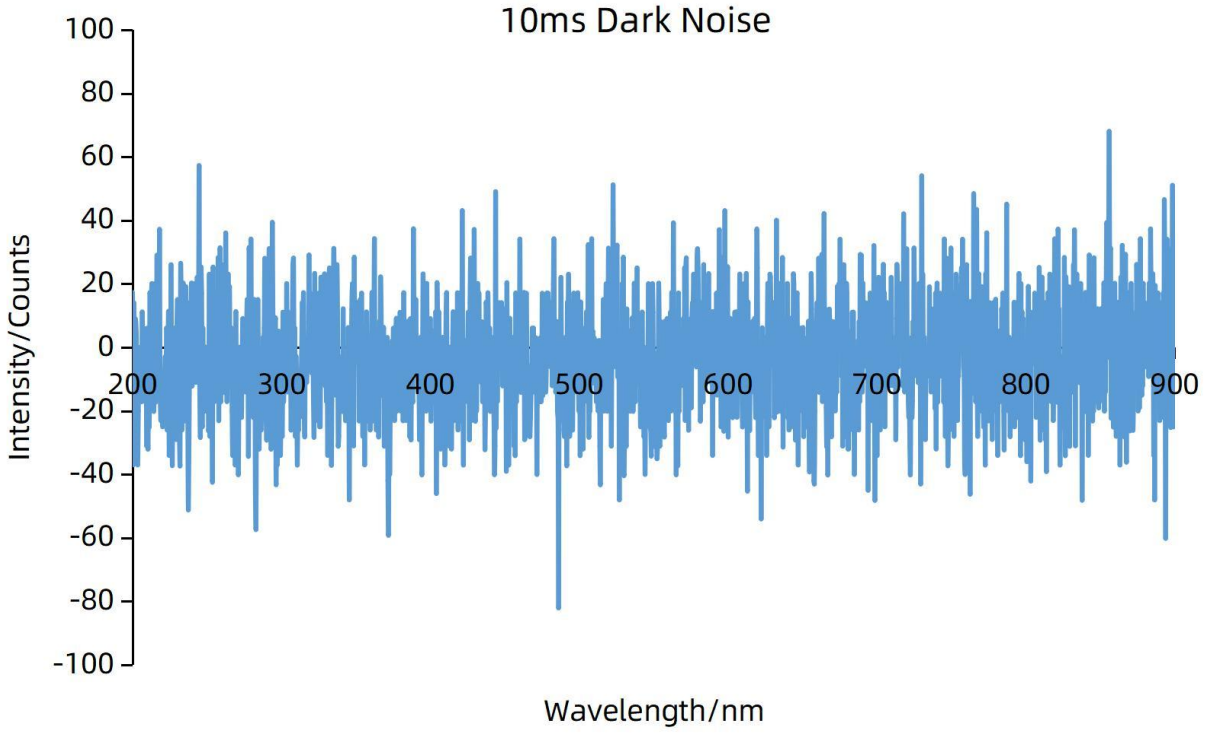
Physical diagram of the spectrometer 24pin interface (note the interface direction)

24	22	20	18	16	14	12	10	8	6	4	2
23	21	19	17	15	13	11	9	7	5	3	1

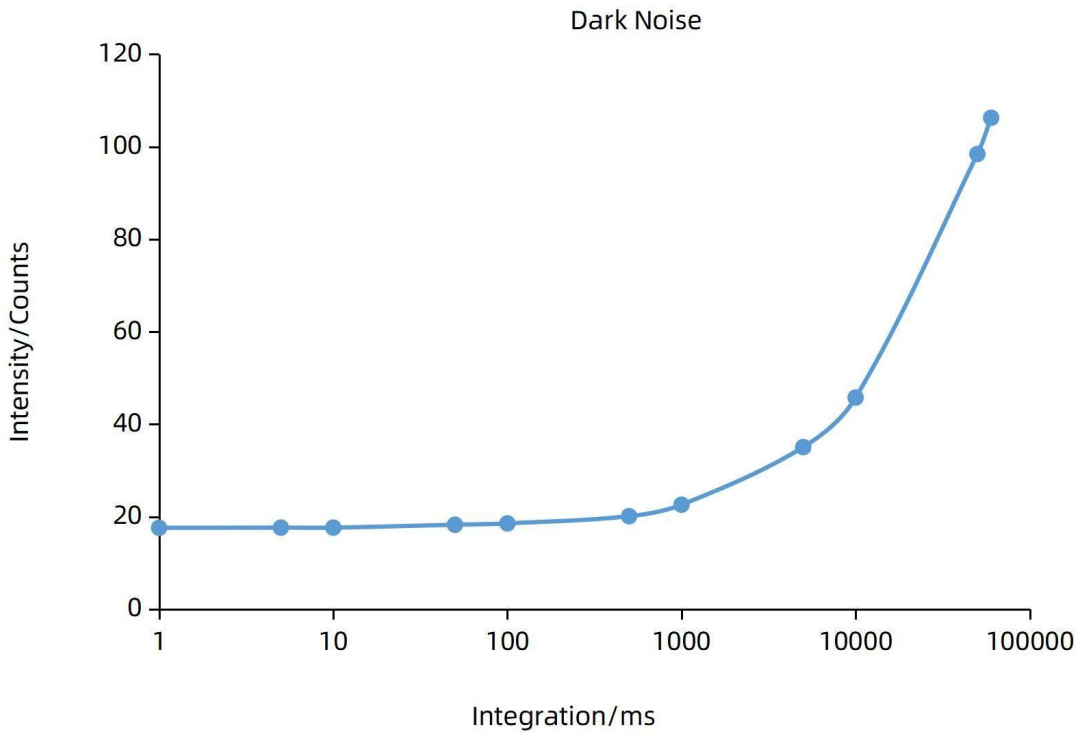
Pin No.	Definition	Function
1	EX_SET	Analog power output for laser power control (input voltage : 0~2.5V)
2	Monitor_RT	Laser temperature feedback
3	TEMP_SET	Reserved
4	Monitor_ILD	Laser power feedback
5	GPIO_PC6	TEC_SB Mode
6	GPIO_PC10	Bluetooth device status pin
7	GPIO_PC7	GPIO output status configurable
8	GPIO_PC11	GPIO output status configurable
9	GPIO_PC8	Laser enable control
10	GPIO_PB8	Reserved
11	GPIO_PC9	Bluetooth control mode pin
12	GPIO_PB9	Reserved
13	UART5_TX	UART data transmission (TTL UART)
14	I2C2_SCL	Reserved
15	UART5_RX	UART data reception (TTL UART)
16	I2C_SDA	Reserved
17	SYNC_OUT	External trigger output signal
18	Laser_CLK	External laser clock output signal
19	InterLock_N	Laser InterLock control (controls laser on/off)
20	SYNC_IN	External trigger input signal
21	DC5V	Positive power supply
22	GND	Power ground
23	DC5V	Positive power supply
24	GND	Signal ground

Typical Spectrum

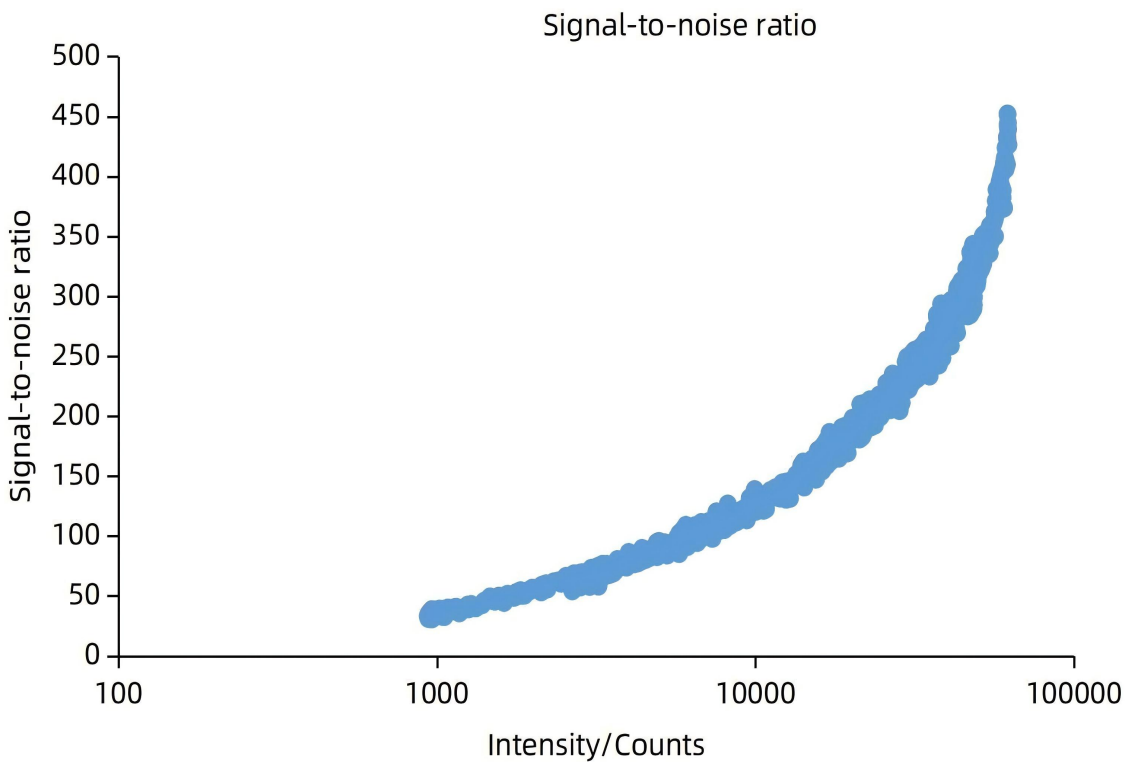
（1）10 ms dark noise



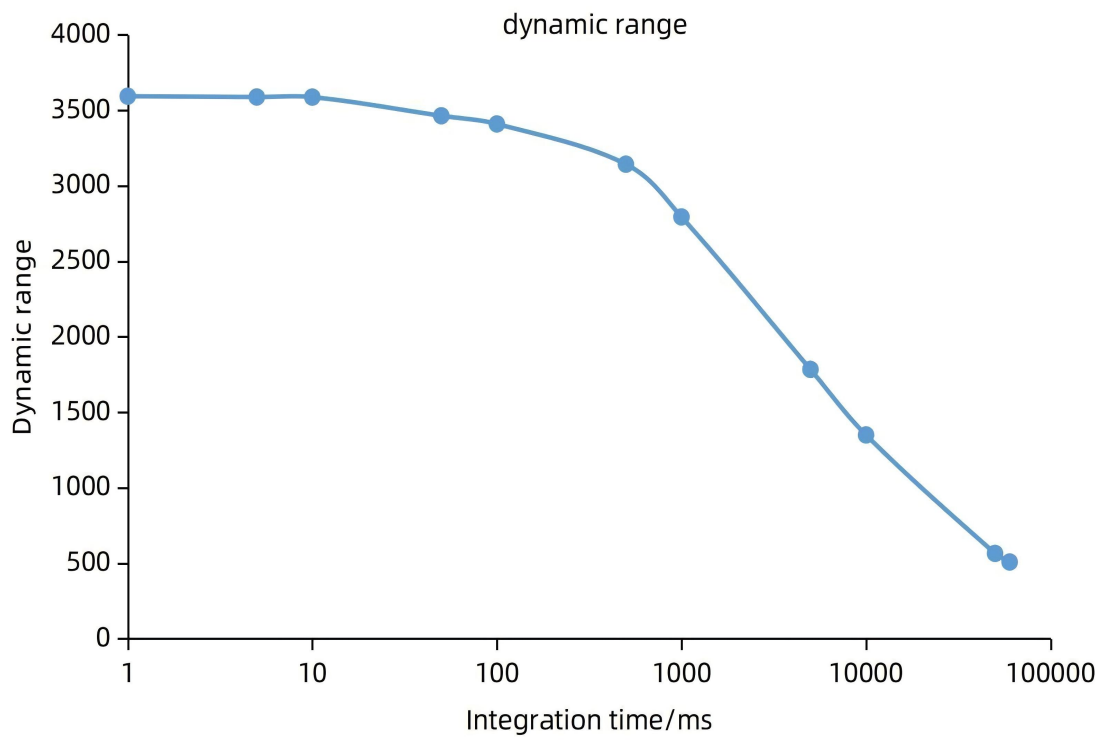
（2）Dark noise VS integration time



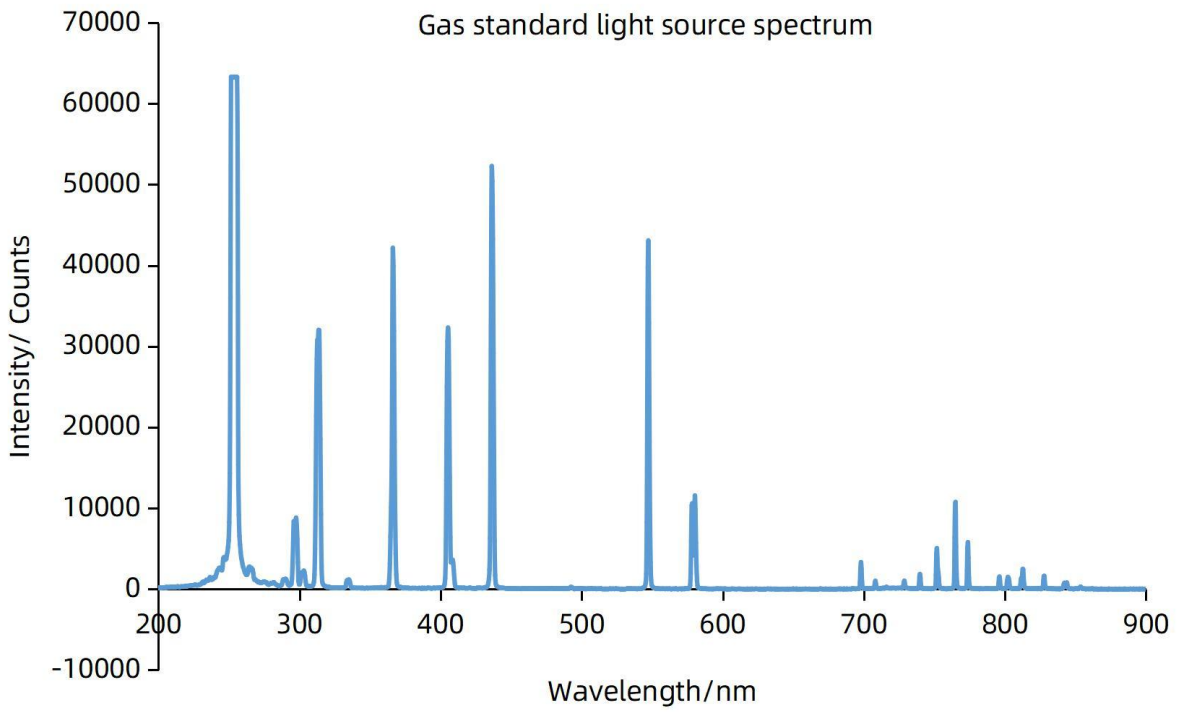
(3) Signal-to-noise ratio



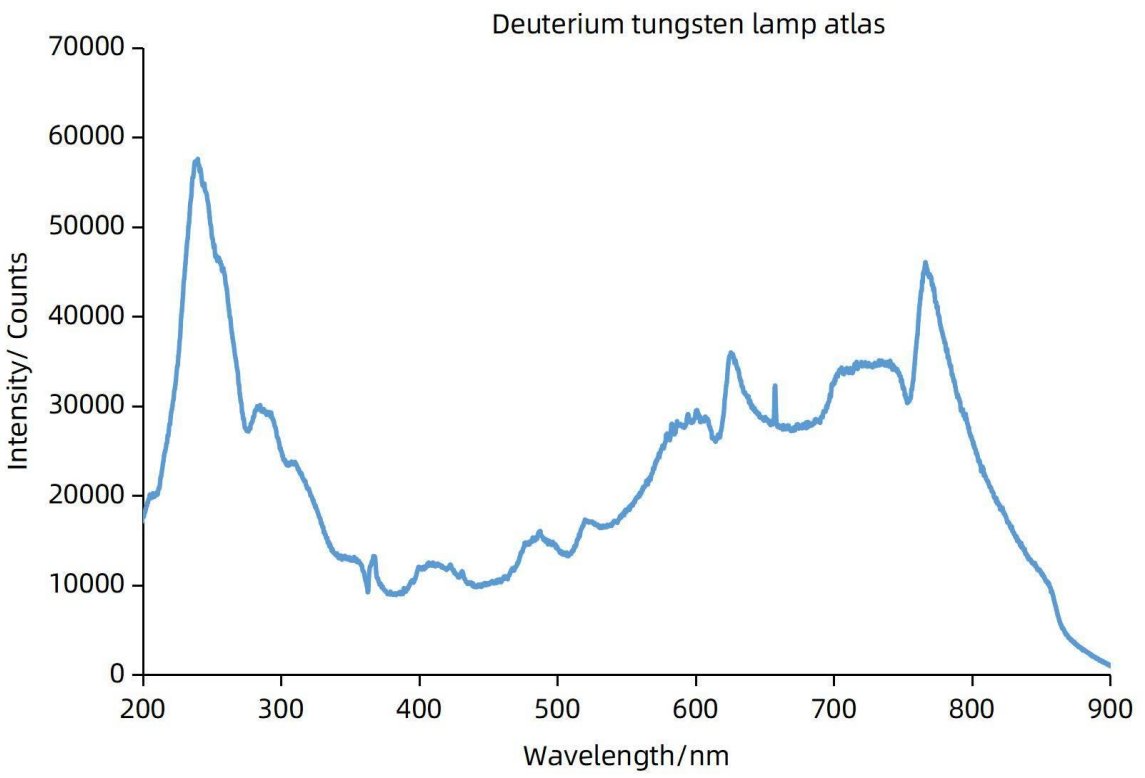
(4) Dynamic range



(5) Standard light source spectrum



(6) Deuterium tungsten light spectrum



VL11639 Series Spectrometer Selection Guide

Model	Spectral Range (nm)	Resolution @ 10μm Slit (nm)	Resolution @ 25μm Slit (nm)	Resolution @ 50μm Slit (nm)	Resolution @ 100μm Slit (nm)	Resolution @ 200μm Slit (nm)
VL11639-200-400	200 - 400	0.50	0.70	0.80	1.30	2.00
VL11639-190-540	190 - 540	0.60	0.80	-	2.00	-
VL11639-790-1050	790 - 1050	0.50	0.70	0.90	-	-
VL11639-200-920	200 - 920	1.20	1.50	-	-	6.20
VL11639-350-1050	350 - 1050	1.20	1.70	2.20	3.80	6.00

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