

先锋科技探测器、光学元件为麻醉气体浓度监测提供解决方案

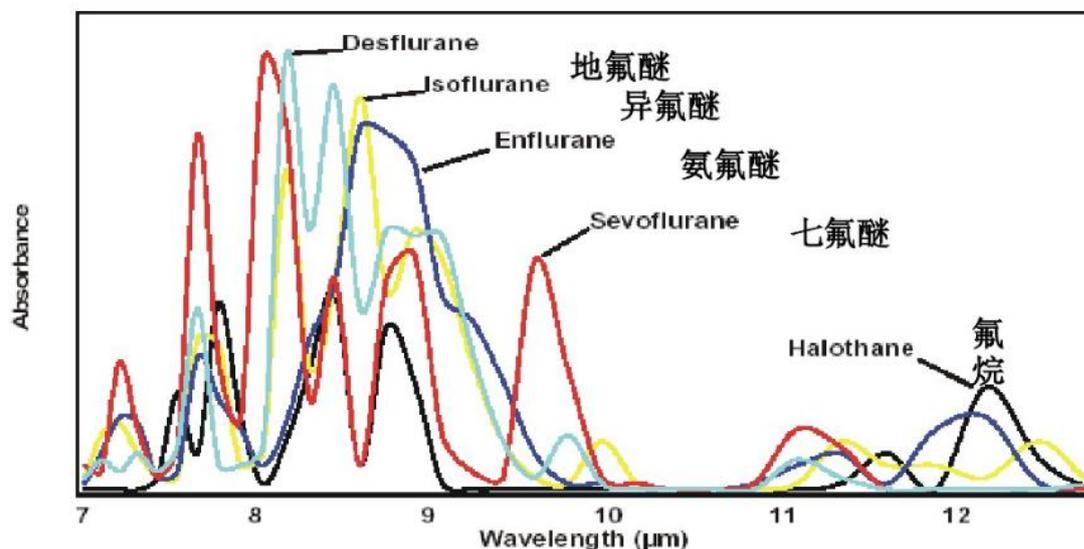
一、麻醉气体浓度检测的意义和作用

在临床上，病人呼吸气体中麻醉气体的含量有着非常重要的意义,麻醉医师可以根据监测结果来安全的调节输入到病人体中的麻醉气体量,从而避免病人因吸入麻醉药过量和不足而导致生命危险。

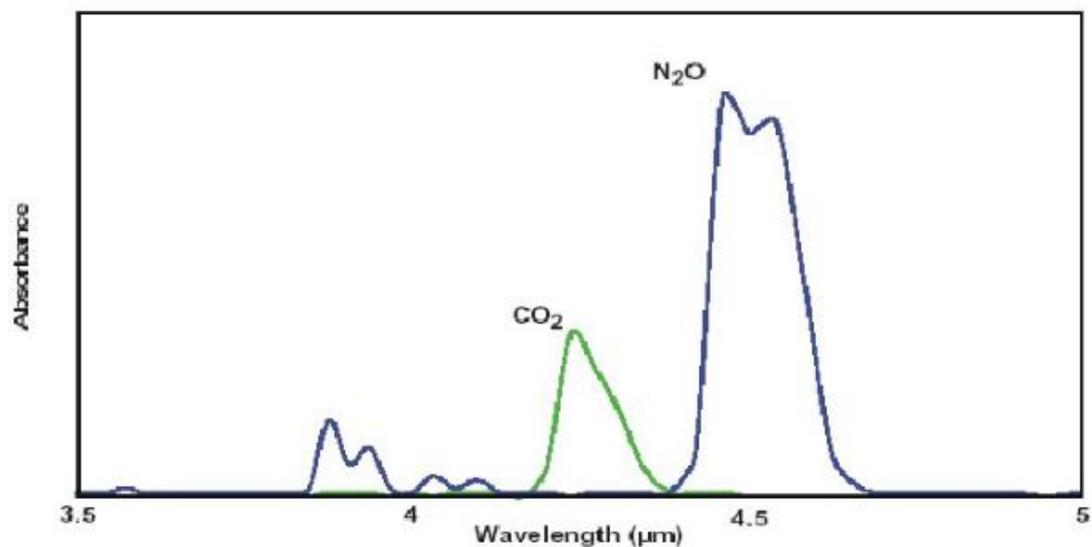
二、浓度检测仪可以监测到的各类指标

■监测吸入/呼出的五种麻醉剂浓度

氨氟醚 ENF、异氟醚 ISO、地氟醚 DES、七氟醚 SEV、氟烷 HAL



■三种气体浓度



笑气 N₂O、CO₂、O₂

■气体呼吸率 AWRR

肺泡气最小有效浓度 MAC

三、我们可以提供的产品

我们可以提供电流输出模式和电压输出模式两种热释电探测器，同时有多种波长的滤光片和窗口片，让你简单便捷的探测到多种气体浓度，满足您多方面的需求。

■多通道电流输出产品参数

Basic Characteristics, Specifications

Part Number	Number of Channels	Element Size [mm]	Aperture Size [mm]	Package	TFC	Amplifier	Feedback Resistor	Supply Voltage [V]
L1200X1810	2	1.8 x 1.0	2.7 x 1.8	TO-39 4 pin	-	Op-Amp 3	27 GOhm	2.7 – 10 (3V recommended)
L2200X1810	2	1.8 x 1.0	2.7 x 1.8	TO-39 4 pin	■	Op-Amp 3	100 GOhm	2.7 – 10 (3V recommended)

提供双通道，三通道和四通道等多通道热释电探测器，采用 LiTaO₃ 材料，可根据客户需求选择温度补偿功能，并直接集成到现有的设计和电子产品中。

Electromechanical Characteristics

Part Number	Absorber	Responsivity ^a [V/W]	D* ^a @ 10 Hz [Jones]	NEP [W/sqrt(Hz)]	-3 dB Frequency	Polarity	Similar Models
L1200X1810	Organic Black	min: 25,000 typ: 35,000	min: 2.0 E+08 typ: 3.0 E+08	max: 4.0 E-10	TBD	Negative	PY4TV-DUAL
L2200X1810	Organic Black	min: 60,000 typ: 120,000	min: 3.0 E+08 typ: 5.0 E+08	max: 3.85 E-10	TBD	Negative	LIM-272

^a Measured with 500K blackbody, 1 Hz bandwidth, without filter / window.

■多通道电压输出产品参数

提供双通道，三通道和四通道等多通道热释电探测器，采用 LiTaO₃ 材料，可根据客户需求选择温度补偿功能，并直接集成到现有的设计和电子产品中。

Basic Characteristics, Specifications

Part Number	Number of Channels	Element Size [mm]	Aperture Size [mm]	Package	TFC	Amplifier	Load Resistor	Supply Voltage [V]
L3200X1810	2	1.8 x 1.0	2.7 x 1.8	TO-39 4 pin	-	JFET 3	100 GOhm	max. +30 (9V recommended)
L4200X1810	2	1.8 x 1.0	2.7 x 1.8	TO-39 4 pin	■	JFET 3	100 GOhm	max. +30 (9V recommended)

Electromechanical Characteristics

Part Number	Absorber	Responsivity [°] [V/W]	D* [°] @ 10 Hz [Jones]	NEP [W/sqrt(Hz)]	-3 dB Frequency	Polarity	Similar Models
L3200X1810	Organic Black	min: 540	min: 2.6 E+08	TBD	TBD	Negative	LM-122
L4200X1810	Organic Black	min: 320 typ: 360	min: 4.5 E+08 typ: 5.0 E+08	max: 4.05 E-10	TBD	Negative	LM-222

[°] Measured with 500K blackbody, 1 Hz bandwidth, without filter / window.

Notes: Polarity: A positive signal is created by positive IR flux change.

Standard Silicon / Crystal Windows

Standard Windows

Code	Name	Thickness [mm]	Description	Transmission Range / Coating Range	Notes
b1	BaF ₂	0.4	Barium Fluoride	UV – 12 μm	
c1	CaF ₂	0.4	Calcium Fluoride	UV – 9 μm	
k1	KBr protected	1.0	Potassium Bromide, protected	UV – 25 μm	
k2	KBr uncoated	1.0	Potassium Bromide, uncoated	UV – 25 μm	Water-soluble
l1	Si (W/P 7.5 μm)	0.55	Silicon longwave-pass filter		Cut on (5 %) ~ 7.22 μm 50% point ~ 7.5 μm
s1	Si uncoated	0.5	Silicon uncoated	2 – 56 μm	for far IR (THz) applications
s2	Si A/R (3 – 5 μm)	0.5	Silicon A/R-coated	3 – 5 μm	
w1	Si WBP (8 – 14 μm)	0.55	Silicon bandpass filter	8 – 14 μm	T ave (9 – 13 μm) > 75 %
z1	ZnSe A/R (2 – 14 μm)	1.0	Zinc Selenide AR-coated, wedged	2 – 14 μm	
z2	ZnSe wedged	1.0	Zinc Selenide wedged	0.6 – 16 μm	

Available Options

Code	Name	Thickness [mm]	Description	Transmission Range	Notes
a1	Sapphire	0.4	Sapphire uncoated	UV – 5 μm	
d1	CVD Diamond	0.15		UV – 100 μm	
i1	CsI	1.0	Caesiumiodide	UV – 50 μm	Water-soluble
p1	HDPE	0.8	High density polyethylene		
Y			without window		No warranty!

Example:

LT.....-b1: Detector with Barium Fluoride window, 0.4 mm thick.

Notes:

Transmission ranges are typical values and are not specified as this is a material property.

■ 滤光片及窗片的选择

Pyroelectric Detectors
Filter and Window Selection



	Code* * letter for small aperture (standard) / Number for large aperture	Application	Comments	CWL [µm]	HPBW [nm]	Angle shift @ AOI 15° [nm]	Tempera- ture shift [nm/K]
NBP3.33-160nm	C	CH ₄ - Methane		3.33 ± 20 nm	160 ± 20 nm	≤ -20	< +0.50
	35						
NBP3.40-120nm	G	HC		3.40 ± 30 nm	120 ± 20 nm	≤ -25	< +0.25
	40						
NBP3.86-90nm	B	Reference for SO ₂ mixtures	NEW	3.86 ± 30 nm	90 ± 20 nm	≤ -20	< +0.50
	41						
NBP3.95-90nm	H	Reference		3.95 ± 35 nm	90 ± 10 nm	≤ -15	< +0.50
	34						
NBP4.26-90nm	T	CO ₂ narrow		4.26 ± 20 nm	90 ± 20 nm	≤ -20	< +0.50
	32						
NBP4.265-110nm	A	CO ₂ balanced	NEW	4.265 ± 20 nm	110 ± 20 nm	≤ -20	< +0.50
	42						
NBP4.26-180nm	D	CO ₂		4.26 ± 20 nm	180 ± 20 nm	≤ -40	< +0.25
	33						
NBP4.27-170nm	Z	CO ₂ standard		4.27 ± 30 nm	170 ± 20 nm	≤ -20	< +0.50
	43						
BP4.30-600nm	F	flame		4.30 ± 50 nm	600 ± 50 nm	≤ -20	< +0.50
	30						
NBP4.45-60nm	E	CO ₂ long path		4.45 ± 20 nm	60 ± 20 nm	≤ -20	< +0.50
	44						
NBP4.66-180nm	I	CO centered		4.66 ± 30 nm	180 ± 20 nm	≤ -20	< +0.50
	39						
NBP4.74-140nm	K	CO flank		4.74 ± 20 nm	140 ± 20 nm	≤ -20	< +0.50
	37						
NBP5.3-180nm	L	NO		5.3 ± 40 nm	180 ± 20 nm	≤ -25	< +0.60
	31						
NBP5.78-180nm	M	H ₂ O in gas mixtures	NEW	5.78 ± 40 nm	180 ± 20 nm	≤ -30	< +0.60
	38						
NBP7.3-200nm	U	SO ₂		7.3 ± 40 nm	200 ± 30 nm	≤ -40	< +0.80
	45						
NBP7.91-160nm	S	Methane in gas mixtures	NEW	7.91 ± 50 nm	160 ± 30 nm	≤ -40	< +0.80
	46						
BP9.50-450nm	O	Alcohol	NEW	9.50 ± 60 nm	450 ± 60 nm	≤ -60	< +1.00
	36						

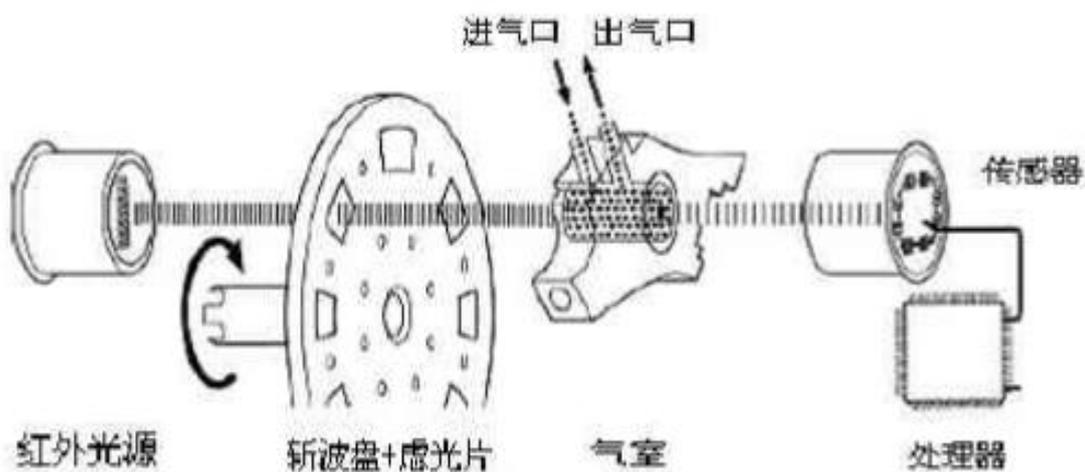
四、测试原理及方法

监测麻醉气体浓度一般有非色散红外测量法，气相色谱法，质谱法等测量方法，这里我们重点介绍第一种测量法。

测试原理：每种气体在红外波段都有自己的特征吸收带，通过在吸收带对红外能量的吸收量，可以反映出气体浓度。

测试方法：在装置中安装若干个红外滤光片，其中一个红外滤光片的波长为参考波长，其余为对各种麻醉气体均有吸收的不同中心波长的滤光片。红外光源依次被各滤光片扫过，并穿过检测气室，由红外传感器进行光电转换，再通过信号放大处理电路，放大后的信号在微处理器电路中经 A/D 转换后，进行反向误差神经网络传播算法处理，识别出麻醉气体种类及其浓度。

麻醉模块里装有八种波长的滤光片，从而得到各种气体的吸光度，帮助精确监测任何状态的所有呼吸气体浓度。



单光源斩波式探头结构图

仪器构造图：采用非色散红外线 NDIR 技术获取麻醉气体浓度信息,旁气流式测量,再用微控制器对信息进行采集、处理,送 PC 机显示,可实现手术过程中对病人呼吸中的麻醉气体含量的无创、实时和连续监测。该装置具有结构简单，准确度高，性价比高等特点。

