

CHAPTERS

Optical Elements

Polarization Optics

Optical Isolators

Optical Systems

Optics Kits

SECTIONS

Beam Expanders

Objective/Scan
Lenses

Camera Lenses

Interferometers

Scanning Galvo
Mirror SystemFree-Space
EO Modulators

Reference Cells

Scanning Fabry-Perot Interferometers (High-Resolution Spectrometers)



SA200

Ultra-Stable Invar Cavity

Features

- Ultra-Stable Invar Cavity
- Confocal Cavity Design
- Input and Output Alignment Irises
- 1.5 GHz or 10 GHz Free Spectral Range
- Low Scan Voltage, 5 V per FSR @ 633 nm
- Wavelength Ranges (Mirror Substrates)
 - 350 - 535 nm (UV Fused Silica)
 - 535 - 820 nm (UV Fused Silica)
 - 820 - 1275 nm (UV Fused Silica)
 - 1275 - 2000 nm (UV Fused Silica)
 - 1800 - 2500 nm (IR Fused Silica)

SA200
Mounted in a KS2

See Page 247

Thorlabs offers 10 scanning Fabry-Perot interferometers that cover five spectral regions with either a 1.5 GHz or 10 GHz Free Spectral Range (FSR). The design of the Fabry-Perot interferometer cavity is comprised of an Invar cavity with internal piezo stacks. This design utilizes the negative thermal coefficient of the piezo stacks to create the nearly athermal cavity that is necessary for the stability of these high-resolution spectrometers.

The tutorial on pages 968 - 969 covers the basic theory of operation, including an explanation of the effect of the input beam diameter on the resolution of the instrument. In order for the instrument to achieve the specified resolution, the input beam diameter must not exceed the maximum diameter specification, even though the input aperture for the instrument is significantly larger than the specification. The relatively simple alignment procedure can be found on our website.

The SA200 series FP Interferometers can be mounted via a Ø2" ring near the input end of the interferometer. The KS2 is the recommended mount because it will hold a SA200 tightly and provide the kinematic control necessary for proper alignment in the optical cavity. The SA210 has a Ø1" mounting ring near the input end of the interferometer, and as a result, the KS1 mount is recommended.



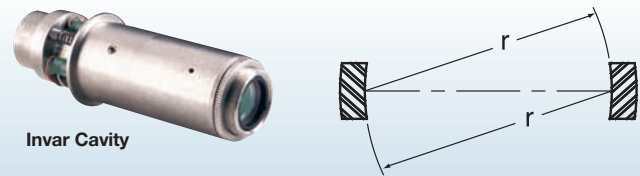
SA210

MODEL	SA200	SA210
FSR ^a	1.5 GHz	10 GHz
Finesse ^b	200 (250 Typ)	150 (180 Typ)
Resolution	7.5 MHz	67 MHz
Max. Beam Diameter ^c	600 µm	150 µm
Cavity Length	50 mm	7.5 mm

^a Free spectral range for a confocal cavity and defined by $FSR = c/4r$ where c is the speed of light.

^b Effective finesse defined by $F_t = FSR/\Delta$, where FSR is defined by $FSR = c/4r$ and $\Delta = FWHM$ impulse response.

^c Maximum beam diameter along the length of the cavity to obtain the typical measured finesse specified.



Invar Cavity

$$F_t = FSR/\Delta$$

Where Δ = FWHM of Impulse Response

1.5 GHz Free Spectral Range, 50 mm Cavity Length, Finesse $F_t \geq 200$ (Typical $F_t = 250$)

ITEM #	\$	£	€	RMB	DESCRIPTION	RECOMMENDED MOUNT
SA200-3B	\$ 2,533.00	£ 1,823.76	€ 2,203.71	¥ 20,188.01	Scanning Fabry-Perot, 350 - 535 nm, 1.5 GHz FSR	KS2 (See Page 247)
SA200-5B	\$ 2,700.00	£ 1,944.00	€ 2,349.00	¥ 21,519.00	Scanning Fabry-Perot, 535 - 820 nm, 1.5 GHz FSR	
SA200-8B	\$ 2,867.00	£ 2,064.24	€ 2,494.29	¥ 22,849.99	Scanning Fabry-Perot, 820 - 1275 nm, 1.5 GHz FSR	
SA200-12B	\$ 3,033.00	£ 2,183.76	€ 2,638.71	¥ 24,173.01	Scanning Fabry-Perot, 1275 - 2000 nm, 1.5 GHz FSR	
SA200-18B	\$ 3,250.00	£ 2,340.00	€ 2,827.50	¥ 25,902.50	Scanning Fabry-Perot, 1800 - 2500 nm, 1.5 GHz FSR	

10 GHz Free Spectral Range, 7.5 mm Cavity Length, Finesse $F_t \geq 150$ (Typical $F_t = 180$)

ITEM #	\$	£	€	RMB	DESCRIPTION	RECOMMENDED MOUNT
SA210-3B	\$ 2,367.00	£ 1,704.24	€ 2,059.29	¥ 18,864.99	Scanning Fabry-Perot, 350 - 535 nm, 10 GHz FSR	KS1 (See Page 247)
SA210-5B	\$ 2,533.00	£ 1,823.76	€ 2,203.71	¥ 20,188.01	Scanning Fabry-Perot, 535 - 820 nm, 10 GHz FSR	
SA210-8B	\$ 2,700.00	£ 1,944.00	€ 2,349.00	¥ 21,519.00	Scanning Fabry-Perot, 820 - 1275 nm, 10 GHz FSR	
SA210-12B	\$ 2,867.00	£ 2,064.24	€ 2,494.29	¥ 22,849.99	Scanning Fabry-Perot, 1275 - 2000 nm, 10 GHz FSR	
SA210-18B	\$ 3,083.00	£ 2,219.76	€ 2,682.21	¥ 24,571.51	Scanning Fabry-Perot, 1800 - 2500 nm, 10 GHz FSR	