

1.1.2.1 Low Noise Lock In Power Sensors

300fW to 100mW

Features

- Chopper and lock in amplifier for lowest noise and drift
- Wavelength range from UV to deep IR
- RM9 pyro is not sensitive to background radiation



The RM9 series Radiometers use a pyroelectric or photodiode sensor in conjunction with chopped CW or quasi CW radiation, using a digitally synthesized lock-in amplifier to reduce external noise to a minimum. The signal is passed through the 18Hz chopper and the chopped signal is detected by the sensor. All signals not at this 18Hz frequency

are suppressed. The output of the sensor is displayed on a standard Ophir meter or PC interface. The chopper may be placed at any convenient location but preferably close to the signal source so as to eliminate interference from all unchopped radiation. The chopper is to be oriented with the indicated side toward the sensor.

Specifications

Model	RM9	RM9-PD
Use	Low level signals	Very low level signals
Detector Type	Pyroelectric	Si Photodiode
Spectral Range	0.15 - 12 μ m ^(a)	0.2 - 1.1 μ m ^(b)
Aperture mm	Ø8mm	Ø10mm
Surface Reflectivity % approx.	50	50
Power Range ^(c)	100nW – 100mW	300fW – 300nW
Power Scales	100mW to 3 μ W	300nW to 3pW
Power Noise Level ^(d)	~30nW	30fW
Minimum Frequency for Pulsed Sources	200Hz	200Hz
Thermal Drift (20min) ^(e)	~30nW	N.A.
Power Accuracy	±5% ^(a)	±5% ^(b)
Damage Threshold W/cm ²	5	5
Response Time with Meter (0-95%) s	3.5s	3.6s
Linearity with Power	±2%	±2.5%

Connections:

1. 1.5 meter cable hard wired to interface module.
2. BNC connector on module for connection to chopper (2 meter BNC to BNC cable included). Perform zeroing with BNC cable removed.
3. 0.5 meter cable from module terminated in DB15 connector.

Cooling	convection	convection
Weight kg	0.37	0.37
Compliance	CE, UKCA, China RoHS	CE, UKCA, China RoHS
Version		
Part Number for RM9 Series with RMC1 Chopper ^(f)	7Y70669	7Y70672
Part Number for RM9 Series Sensors	7Z02952	7Z02953

Note: (a) At calibrated wavelengths 500 – 1100nm. At other wavelengths, there is an additional error as follows: <500nm add ±8%, 1100 – 3000nm add ±5%, 10.6 μ m add ±15%

Note: (b) At calibrated wavelengths 200 – 1100nm. For <700nm add ±2% additional error

Note: (c) For LaserStar, Pulsar, USBI, Quasar and Nova, upper limit is 1mW for RM9 and 90nW for RM9-PD. For these models, accuracy may also be less than values given above

Note: (d) Averaged over 10s

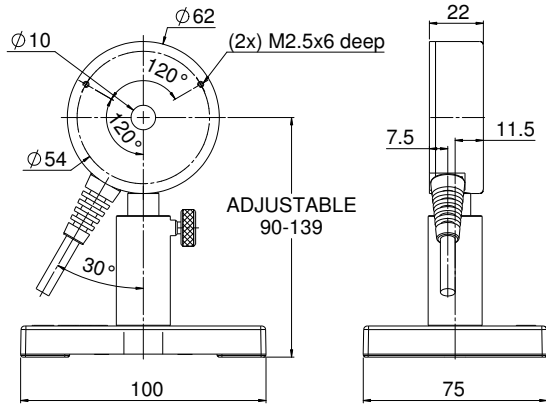
Note: (e) In a typical laboratory environment

Note: (f) The RMC1 or another chopper unit that can be set to 18Hz is required for operation of the RM9 series sensors

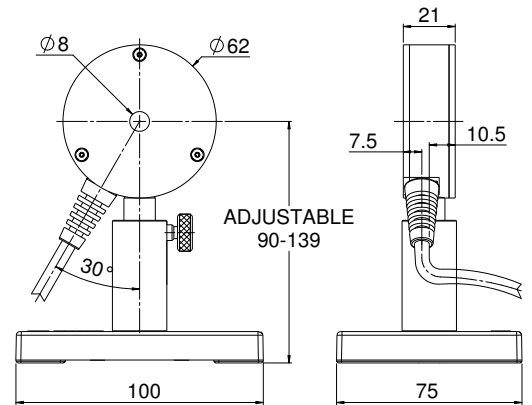
* For drawings please see page 46

Model	RMC1 Chopper
Use	Chopper for RM9 series
Aperture	Ø22mm
Chopping Frequency ^(a)	18Hz
Power Consumption	85mA
Connections:	
1. BNC to interface module	
2. 12V wall cube power supply (included)	
3. Mini USB connector (factory use only)	
Note: (a) not adjustable by user.	

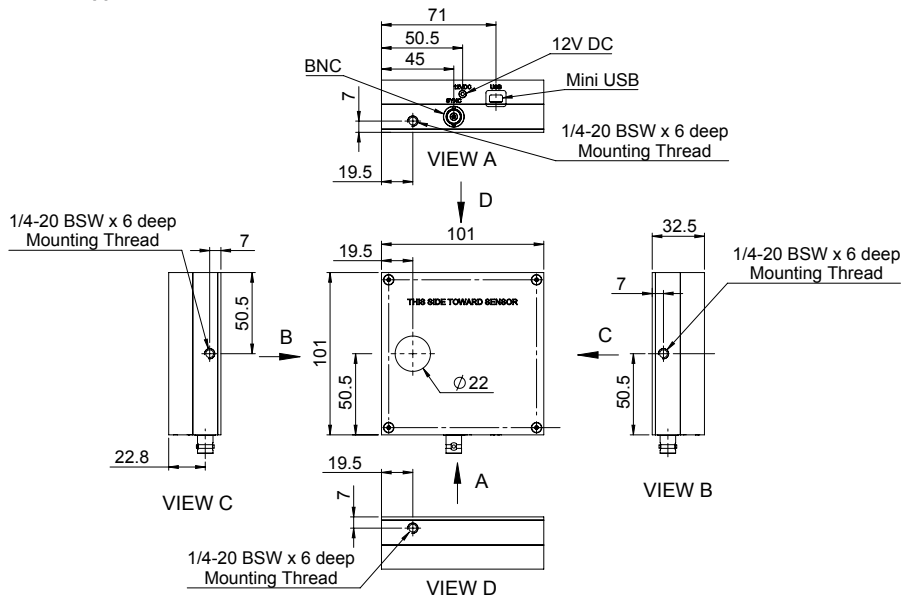
RM9-PD Sensor



RM9 Sensor



Radiometer-Chopper



Interface Module

