1.1.2.1 Low Noise Lock in Power Sensors

100nW to 100mW

Features

- Chopper and lock in amplifier for lowest noise and drift
- Terahertz wavelength range 0.1 – 30THz
- 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.

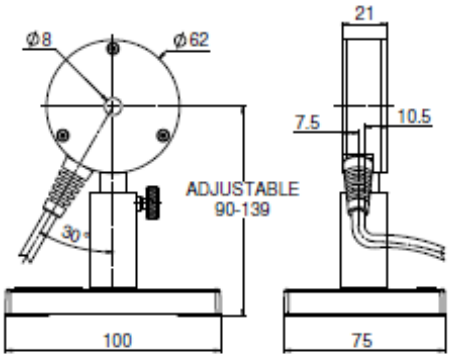
Specifications

Model **Use**	**RM9-THz** **Low level Terahertz**
Detector Type	Pyro with THz absorber
Spectral Range	0.1 – 30THz [e]
Aperture mm	Ø8mm
Surface Reflectivity % approx.	40 - 70
Power Range [a]	100nW-100mW
Power Scales	100mW to 3µW
Power Noise Level [b]	~20nW
Minimum Frequency for Pulsed Sources	200Hz
Thermal Drift (20min) [c]	~15nW
Power Accuracy	±10% [e]
Damage Threshold W/cm^2	5
Response Time with Meter (0-95%) s	3.5s
Linearity with Power	±2%
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
Weight kg	0.37
Compliance	CE, UKCA, China RoHS
Version	
Part Number for RM9-THz with RMC1 Chopper [d] **Part Number for RM9-THz Sensor**	**7Y70678** **7Z02956**
Note: (a) For LaserStar, Pulsar, USBI, Quasar and Nova/Orion, upper limit is 1mW for RM9-THz. For this model, accuracy may also be less than values given above	
Note: (b) Averaged over 10s	
Note: (c) In a typical laboratory environment	
Note: (d) The RMC1 or another chopper unit that can be set to 18Hz is required for operation of the RM9 series sensors	
Note: (e) The sensor is calibrated for 0.7, 1.5, 2.5, 4 and 10THz. Response at other frequencies can be interpolated from the graph on page 46. Stated accuracy is for frequencies or interpolated frequencies in the range 0.7 – 5THz. For 5 – 10THz, the calibration uncertainty is 15% and for frequencies outside that range, approximate readings can be calculated from the graph but no specified accuracy is given.	

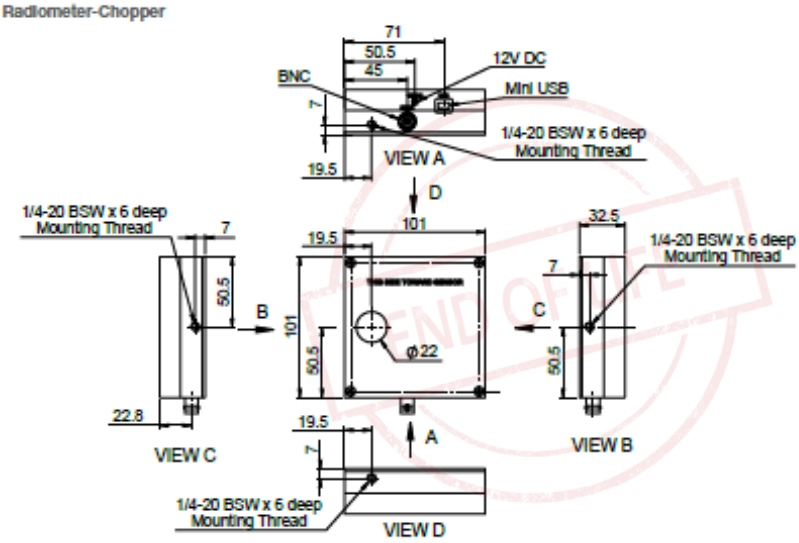
* For drawings and graphs please see page 46

Model **Use**	**RMC1 Chopper** **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-THz Senson



Radiometer-Chopper



Interface Module