

## ELTEC Pyroelectric Detector Model 407M56

### Thermally Compensated Single Element Detector

- CO<sub>2</sub> gas sensor with hermetic brazed sapphire window.
- These detectors have a compensating element behind the sensing element, that reduces the effect of ambient temperature changes by a factor of appx. 10. This is very practical in many industrial applications, but they do not reach the performance (detectivity) of single element devices.

Detector Model	407M56
Detector Type	POD Thermally Compensated
Element Size	0.97 x 2.49 mm
Element Material	Lithium Tantalate
Responsivity (typ.)	1.374 V/W
Noise (typ.)	2.38 $\mu$ V
NEP (typ.)	1.73e8 W/sqrt(Hz)
D* (typ.)	0.06e7 cm * sqrt(Hz) / W
Operating Voltage (min/max)	3 / 14 VDC
Offset Voltage (min/max)	0.30 / 1.20 VDC
Current Draw (min/max)	3.0 / 12.0 $\mu$ A
Thermal Breakpoint (typ.)	0.2 Hz
Electrical Breakpoint (typ.)	0.1 Hz
Recommended Operating Temperature	-10 ... +50 °C
Storage Temperature	-55 ... 125°C
Output Polarity	Positive for a positive change
Output Impedance	< R <sub>s</sub>
Output Protection	Do not exceed a maximum drain current of 40 $\mu$ A
Thermal Shock	The rate of temperature change must be kept to a minimum (<50°C/minute) to prevent damage in internal electronics.

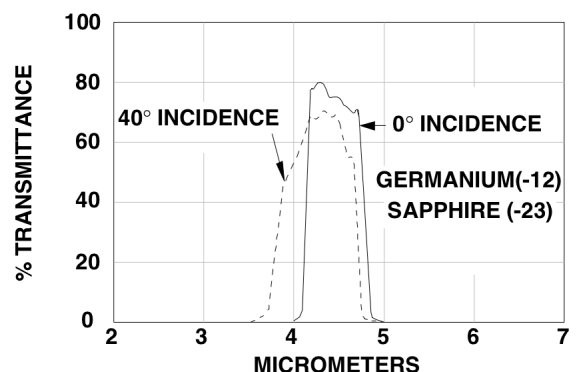
(Data is established on a sample basis and is believed to be representative)

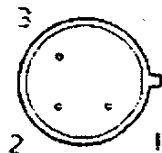
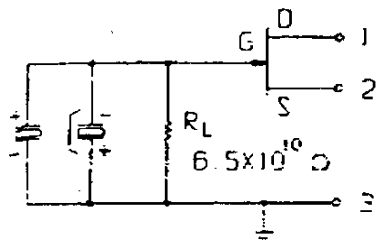
### Optical Filter Configuration

With -12 germanium filter

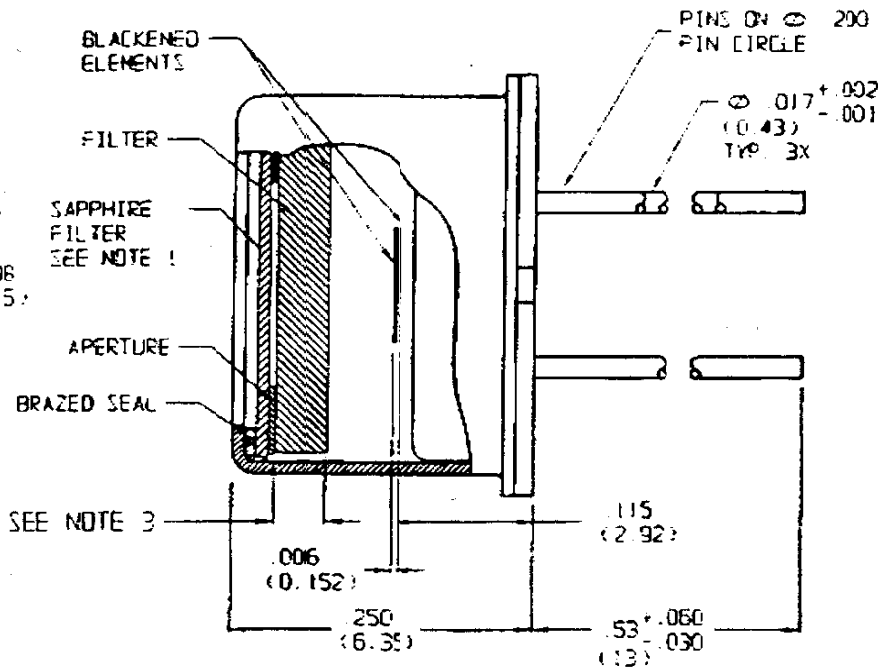
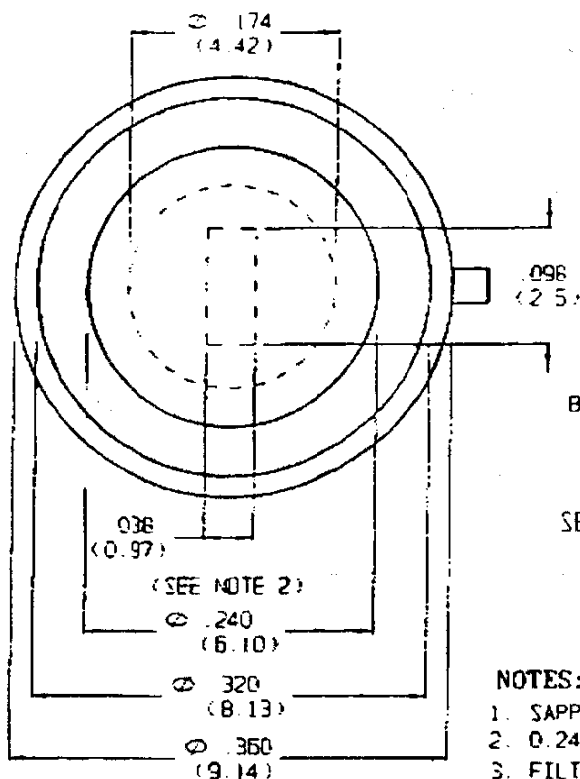
The -12 filter is used where there is a sapphire optical element in the system anyway and the long wave blocking is not needed. Note: Although the -12 offers electrostatic shielding, its bandpass opens up again after 6 micrometers.

Model denomination with filter	407M56-12
Material	germanium
Type	bandpass filter
Center Wavelength [ $\mu$ m]	4.48
Half Width Wavelength (HBW) [ $\mu$ m]	0.62
Transmission	70%





**BOTTOM VIEW**  
(NO SCALE)



**NOTES:**

1. SAPPHIRE FILTER AND CAN HAVE BRAZED SEAL
2. 0.240 DIA. MIN. CLEAR APERTURE.
3. FILTER THICKNESS DEPENDENT ON TYPE. THIS MODEL ACCOMMODATES FILTERS .010 MIN TO .077 MAX THICK.
4. OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES.
5. IF MODEL IS ORDERED WITHOUT THE FILTER, APERTURE WILL BE ELIMINATED.

PIN	DESIGNATION
1	V +
2	OUTPUT
3	CASE/GROUND

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UNLESS OTHERWISE SPECIFIED	
DIMENSIONS ARE IN INCHES (MM)	
TOLERANCES	
DECIMAL	FRACTIONAL
XX = +/- .010	+/- 1/64
XXX = +/- .005	ANGULAR
	+/- 1°
BREAK SHARP CORNERS	

REV	ECN	DATE	DESCRIPTION	BY	CHK
A	1577	3-27-03	ADD NOTE #5	BLW	
			TITLE: <b>MODEL 407M56</b>		
			<b>THERMALLY COMPENSATED PYROELECTRIC IR DETECTOR</b>		
CHECKED BY		DD	11-28-00	SIZE	DWG. NO.
APPROVED BY		LC	11-30-00	A	7800807
			FILE 7800807c.dwg	SCALE 6.5/1	DATE 11-28-00