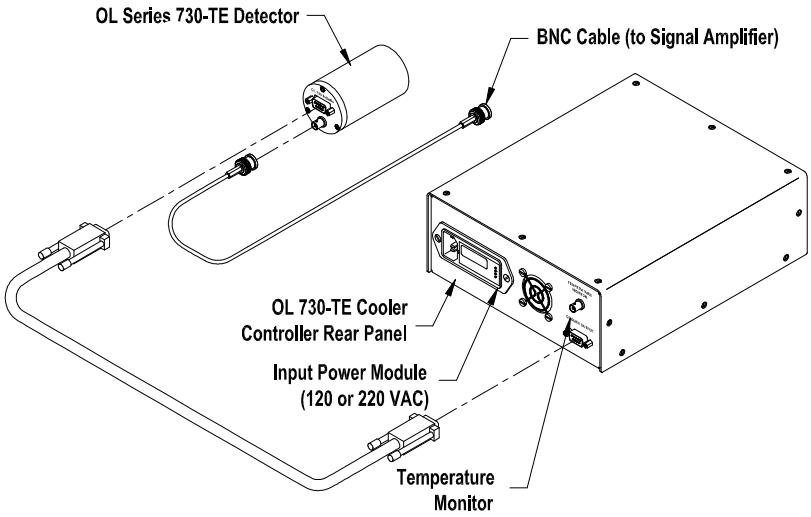
light All光傲
光 电 计 量 测 试 专 家
400-921-9858 sales@light-all.com www.light-all.com

Gooch & Housego



OL Series 730-TE Thermoelectrically Cooled Detector Packages

The OL Series 730-TE Thermoelectrically Cooled Detector Packages are designed for making broadband measurements with radiometer/photometers, such as the OL 730A, OL 730C, and OL 730CV, or lock-in amplifiers, such as the OL 730D. The OL 730-TE Cooled Detectors can also be used for making spectral measurements with spectroradiometer systems, such as the OL Series 740 and 746. The standard BNC signal output enables the OL 730-TE Detectors to be used with a variety of other instruments as well. Measurements can be made over all or part of the wavelength range from 0.2 to 5 µm depending on the detector selected.

The OL 730-Si, OL 730-Ge, OL 730-InGaAs, OL 730-PbS, and OL 730-PbSe TE Cooled Detector Packages consist of the OL 730-TE Cooler Controller and the Thermoelectrically Cooled Detector. The OL 730-XX-C refers to the calibrated version of the Thermoelectrically Cooled Detector Package.

Circuit assemblies include a thermoelectric controller card located in the OL 730-TE Cooler Controller and detector interface board located in the Thermoelectrically Cooled Detector. The OL 730-TE Cooler Controller is capable of accepting any of the Thermoelectrically Cooled Detectors. All cooler reference settings are controlled by the detector interface board. This enables the user to purchase several detectors for use with the same OL 730-TE Cooler Controller. Only one detector may be operated at a time.

Contact: orlandosales@goochandhousego.com www.GHinstruments.com

As part of our policy of continuous product improvement, we reserve the right to change specifications at any time

light All光傲
光 电 计 量 测 试 专 家
400-921-9858 sales@light-all.com www.light-all.com

Cooler Controller

OL 730-TE Cooler Controller

The OL 730-TE Cooler Controller contains a precision temperature controller that supplies a nominal 2.0 Volts to the thermoelectric element at 1.0 amperes. The temperature is precisely controlled by comparing the voltage drop of the biased thermistor to the detectors preset reference that is biased in the same manner. The two voltages are fed to a precision operational amplifier operating as a comparator. The amplifier controls a series pass Darlington transistor that regulates the thermoelectric cooler current. The feedback control produces very stable temperature operation (typ. $< \pm 0.5$ °C) independent of moderate fluctuations in ambient temperature. The OL 730-TE Cooler Controller also contains bias batteries when supplied with either the OL 730-PbS or OL 730-PbSe Detectors. The alkaline batteries are EMI shielded and relay controlled by the power switch. Hardware is included in the cooler controller chassis for field installation of the OL 730-PbS and OL 730-PbSe bias batteries. A temperature monitor is provided at the cooler chassis rear panel. This enables monitoring of the thermistor voltage (temperature) using a voltmeter. A dual primary transformer and input power module permits rapid conversion of the input power to 120 or 240 VAC.

Detectors

General Description

The thermoelectrically cooled OL Series 730 Detectors consist of a TO-8 package with Peltier cooler, thermistor and detector. This TO-8 package is mounted in a 1.876 inch (4.76 cm) diameter x 3.43 inch (8.71 cm) long machined aluminum housing. The TO-8 package offers a very high detectivity without the inconvenience or bulk of liquid cooling dewars. Each OL Series 730 detector housing also contains a detector interface PCB. This interface provides precision reference sources that control the reference temperature and thermistor bias. The black anodized housing provides ample heatsinking for most laboratory applications. When used in the spectroradiometric mode, the increased heatsinking from the monochromator allows routine operation to 40 °C ambient temperature.

OL 730-Si Detector

The OL 730-Si Silicon Detector consists of a 5.8 mm X 5.8 mm, high impedance, low capacitance, UV enhanced, planar diffusion photodiode. It provides excellent sensitivity over the 0.2 µm to 1.1 µm wavelength region. The photodiode exhibits superior uniformity over the entire active area. It is capable of linear operation over 13 decades of dynamic range. Thermal stability of 0.1%/°C for wavelengths below 1 µm is typical. Typical detectivity is 3×10^{-13} cm $Hz^{1/2}$ W^{-1} (Peak, 167 Hz, 1 Hz), at a peak wavelength of 960 nm. The typical noise level at 167 Hz, with 1 Hz bandwidth is 5×10^{-15} ampere.

OL 730-Ge Detector

The OL 730-Ge Germanium Detector is a premium quality, high impedance, low capacitance, passivated photodiode operating in a photovoltaic (unbiased) mode. It is particularly well suited for measurements in the 0.8 µm to 1.8 µm wavelength region. The 5 mm diameter Ge diode is mounted with a precision thermistor on a two stage thermoelectric cooler and hermetically sealed with dry nitrogen in a TO-8 package with a glass window.

Typical detectivity is 5.7×10^{11} cm $Hz^{1/2}$ W^{-1} (Peak, 167 Hz, 1 Hz), at a peak sensitivity of 1.55 µm. The response at 1.74 µm exceeds 20% of the peak response. The standard operating circuit consists of the germanium detector operated in a common anode. The output may be connected to an operational amplifier configured for current measurement. The detector may also be shunted with a 75Ω resistor for monitoring with an oscilloscope. The typical noise level at 167 Hz, with a 1 Hz bandwidth, is 7.0×10^{-13} A corresponding to an infrared flux of approximately 7.8×10^{-13} W.

OL 730-InGaAs Detector

The OL 730-InGaAs Indium Gallium Arsenide Detector consists of high impedance, planar photodiode mounted with a thermistor on a single stage thermoelectric cooler. It is particularly well suited for measurements in the 0.8 µm 1.8 µm wavelength range. The 3 mm diameter InGaAs detector is mounted in a hermetically sealed TO-8 package with a sapphire window.

Typical detectivity is 1.6×10^{12} cm $Hz^{1/2}$ W^{-1} (Peak, 167 Hz, 1 z), at a peak sensitivity of 1.6 µm. The response at 1.72 µm exceeds 20% of the peak response. The standard operating circuit consists of the InGaAs detector operated in a common anode. The output may be connected to an operational amplifier configured for current measurement. The detector may be shunted with a 75Ω resistor for monitoring with an oscilloscope. The typical noise level at 167 Hz, with a 1 Hz bandwidth, is 1.5×10^{-13} A corresponding to an infrared flux of approximately 1.7×10^{-13} W.

Contact: orlandosales@goochandhousego.com www.GHinstruments.com

As part of our policy of continuous product improvement, we reserve the right to change specifications at any time

light All光傲
光 电 计 量 测 试 专 家
400-921-9858 sales@light-all.com www.light-all.com

OL Series 730-TE Thermoelectrically Cooled Detector Packages

Gooch & Housego

OL 730-PbS Detector

The OL 730-PbS Lead Sulfide Detector consists of a chemically deposited thin film, photo-conductive, lead sulfide cell mounted with a thermistor on a single stage thermoelectric element. It is particularly well suited for measurements in the 1 µm to 3 µm wavelength range. The 3 mm x 3 mm PbS detector is mounted in a hermetically sealed TO-8 package with a sapphire window.

Typical detectivity is 2.1 x 10^{11} cm $Hz^{1/2}$ W^{-1} (Peak, 167 Hz, 1 Hz), at a peak sensitivity of 2.5 µm. The response at 3 µm exceeds 20% of the peak response. The standard operating circuit consists of the detector in series with a load resistor and a bias battery, with the AC coupled output signal monitored across the load resistor. The typical noise level at 167 Hz, with a 1 Hz bandwidth, is 0.5 µV corresponding to an infrared flux of approximately 1.4 x 10^{-12} W.

OL 730-PbSe Detector

The OL 730-PbSe Lead Selenide Detector consists of a chemically deposited thin film, photo-conductive, lead selenide cell mounted with a thermistor on a single stage thermoelectric module. It is particularly well suited for measurements in the 1 µm to 5 µm wavelength range. The 3 mm x 3 mm PbSe detector is mounted in a hermetically sealed TO-8 package with a sapphire window.

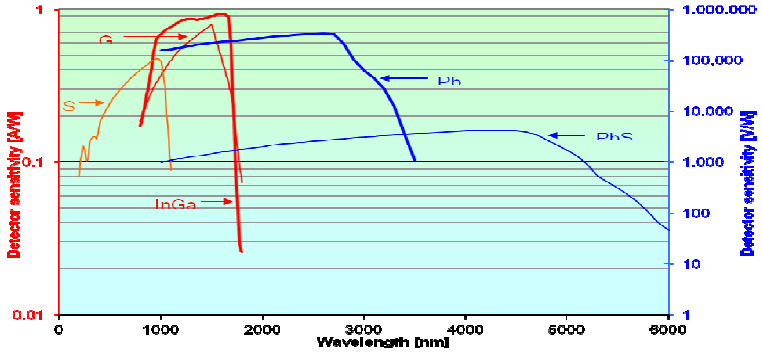
Typical detectivity is 1.9 x 10^{9} cm $Hz^{1/2}$ W^{-1} (Peak, 167 Hz, 1 Hz), at a peak sensitivity (4.4 µm). The response at 5.2 µm exceeds 20% of the peak response. The standard operating circuit consists of the detector in series with a load resistor, across the bias battery, with the AC coupled output signal monitored across the PbSe cell. A typical noise level at 167 Hz, with a 1 Hz bandwidth, is 0.5 µV corresponding to an infrared flux of 1.5 x 10^{-10} W

SPECIFICATIONS

OL 730-TE Cooler Controller

Input Power	120 or 220 VAC (User Selectable)
Power Consumption	0.3 A 120 VAC, 0.15 A 220 VAC
Fuse	0.5 A (fast blow)
Temperature Control Range (Detector Dependant)	-40 °C to 10 °C
Ambient Operating Temperature Range	15 °C to 30 °C
Foldback Threshold	2.5 V
TE Output Ripple (Maximum)	10 mV p.p.
Bias Voltage (OL 730-PbS and OL 730-PbSe only)	-64 V ±4 V
TE Voltage	2.0 V
TE Current	1.5 A
Dimensions	8.50"W X 10.00"D X 3.38"H / 4.50 lbs.

OL Series 730-TE Thermoelectrically Cooled Detector Packages
Detector Responsivities



Contact: orlandosales@goochandhousego.com www.GHinstruments.com

As part of our policy of continuous product improvement, we reserve the right to change specifications at any time

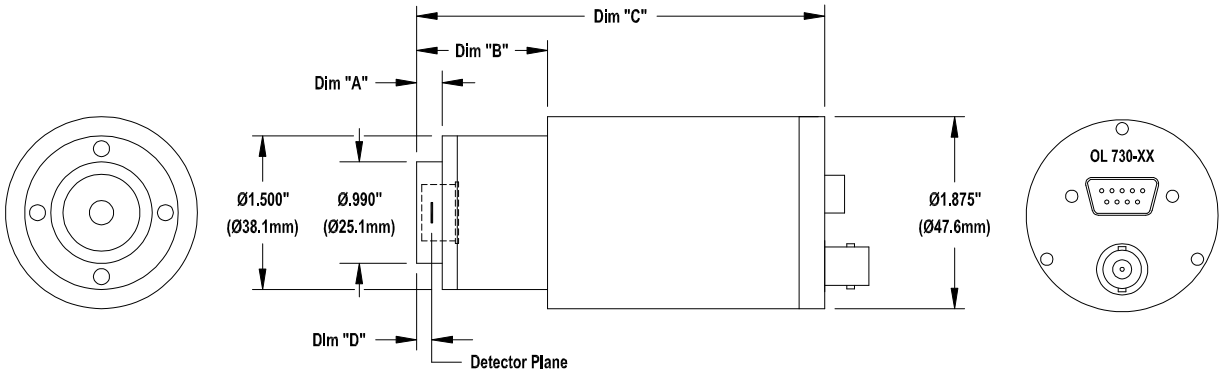
light All光傲
光 电 计 量 测 试 专 家
400-921-9858 sales@light-all.com www.light-all.com

OL Series 730-TE Thermoelectrically Cooled Detector Packages

Gooch & Housego

Detector Specifications

PARAMETER	OL 730-Ge	OL 730-InGaAs	OL 730-PbS	OL 730-PbSe	OL 730-Si
Operating Temperature (Nominal)	-20°C	-30°C	-10°C	-10°C	5°C
Active Area (diameter)	5 mm	3 mm	3 mm X 3 mm	3 mm X 3 mm	5.8 mm X 5.8 mm
Spectral Range	0.8 µm to 1.8 µm	0.8 µm to 1.8 µm	1.0 µm to 3.0 µm	1.0 µm to 6.0 µm	0.2 µm to 1.1 µm
Peak Responsivity (Nominal)	.90 A/W	.90 A/W	3.5×10^5 V/W	3.2×10^3 V/W	0.5 A/W
NEP (Nominal) @ Peak Wavelength	1×10^{-12} W @ 1.5 µm	1.7×10^{-13} W @ 1.6 µm	1.5×10^{-13} W @ 2.6 µm	1.5×10^{-10} W @ 4.4 µm	1×10^{-15}W @ 960 nm
Detector Impedance (Nominal)	N/A	N/A	2 MΩ (-10ºC)	2 MΩ (-10ºC)	2 MΩ (-10ºC)
Output Impedance (Nominal)	2 M (-20ºC)	20 MΩ (-30ºC)	1MΩ	1MΩ	1GΩ
Frequency Response (Nominal)	DC to ≈200 kHz	DC to >200 kHz	DC to ≈10 kHz	DC to ≈10 kHz	DC to ≈1 MHz



Detector	Dim "A"	Dim "B"	Dim "C"	Dim "D"
OL 730-Ge	.250" (6.35mm)	1.28" (32.5mm)	3.990" (101.3mm)	.130" (3.3mm)
OL 730-InGaAs	.250" (6.35mm)	1.28" (32.5mm)	3.990" (101.3mm)	.157" (4.0mm)
OL 730-PbS	.250" (6.35mm)	1.28" (32.5mm)	3.990" (101.3mm)	.217" (5.5mm)
OL 730-PbSe	.250" (6.35mm)	1.28" (32.5mm)	3.990" (101.3mm)	.212" (5.4mm)
OL 730-Si	.100" (2.5mm)	1.145" (29.1mm)	3.855" (97.9mm)	.100" (2.5mm)

Figure 3 – Detector Housing w/ Overall Dimensions