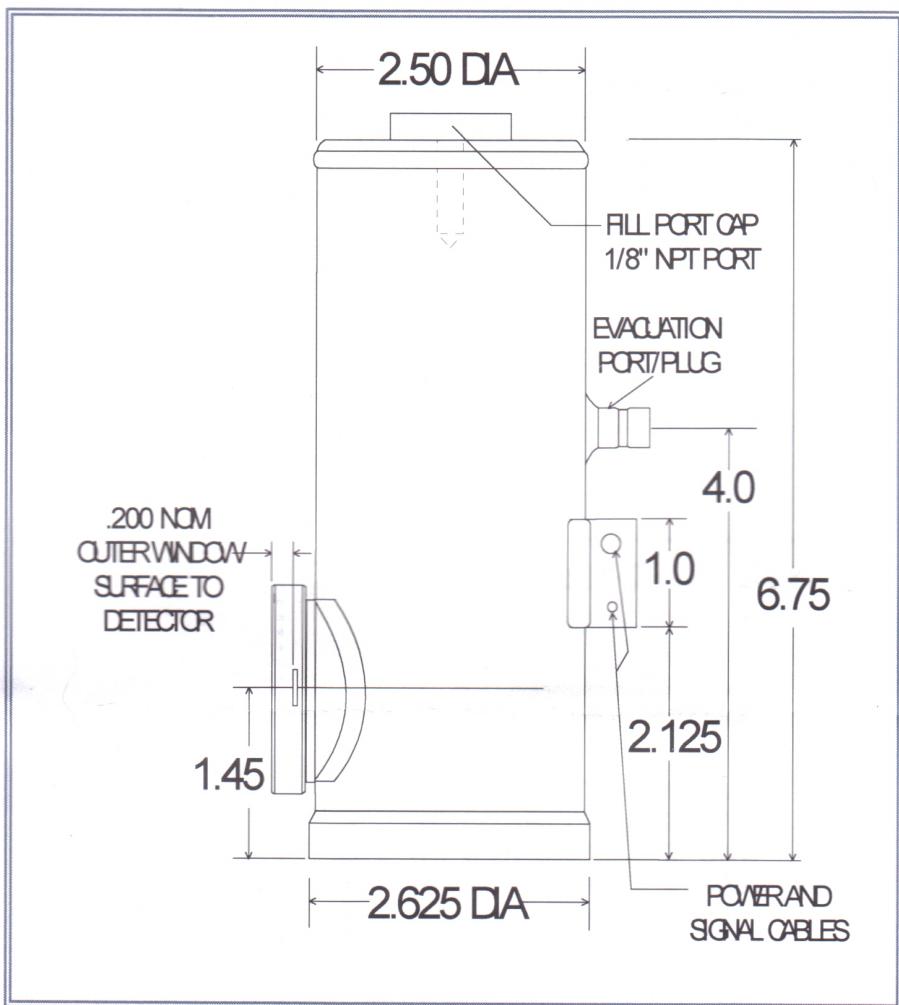


## MCT SERIES CRYOGENIC PHOTODETECTOR/AMPLIFIER



**Part No:**  
**MCT20-010-E-LN6N**  
s/n 021509

**Application Note**

This unit is a high performance cryogenically operated HgCdTe photodetector/amplifier. The unit should be at LN<sub>2</sub> temperature before turning on power to the amplifier. A funnel is provided to assist in the filling of the dewar, which is best accomplished by gradually filling and topping off over a several minute period.

The amplifier has a dual gain function controlled by a switch on the backplate. The HI (up) position is  $\times 10$  above the LO (down) position. Output is thru a BNC-type cable, and power is connected thru a shielded multi-wire cable terminated in a 9-pin Dsub connector or solder leads.

**S P E C I F I C A T I O N S**

<b>Active Area</b>	<b>1 mm x 1 mm</b>
<b>Spectral Range</b>	<b>2 - 20 <math>\mu</math>m ; pk @ ~ 18 <math>\mu</math>m</b>
<b>Detectivity (D*pk,10kHz,1Hz)</b>	<b><math>1.7 \times 10^{10}</math> cm-Hz<math>^{1/2}</math>/W</b>
<b>Dewar Hold Time</b>	<b>12 hours minimum with liquid N<sub>2</sub></b>
<b>Field of View / Window Material</b>	<b>60° nominal / KRS-5</b>
<b>Responsivity (pk), @ amp out</b>	<b><math>7.8 \times 10^5</math> HI ; <math>10^4</math> V/W LO V/W</b>
<b>Noise Voltage (10kHz), @ amp out</b>	<b><math>4.5 \times 10^{-6}</math> HI / <math>10^{-7}</math> LO V/Hz<math>^{1/2}</math></b>
<b>Bandwidth</b>	<b>5 Hz - 50kHz</b>



## Receiver Modules

### MCT SERIES CRYOGENIC PHOTODETECTOR/AMPLIFIER

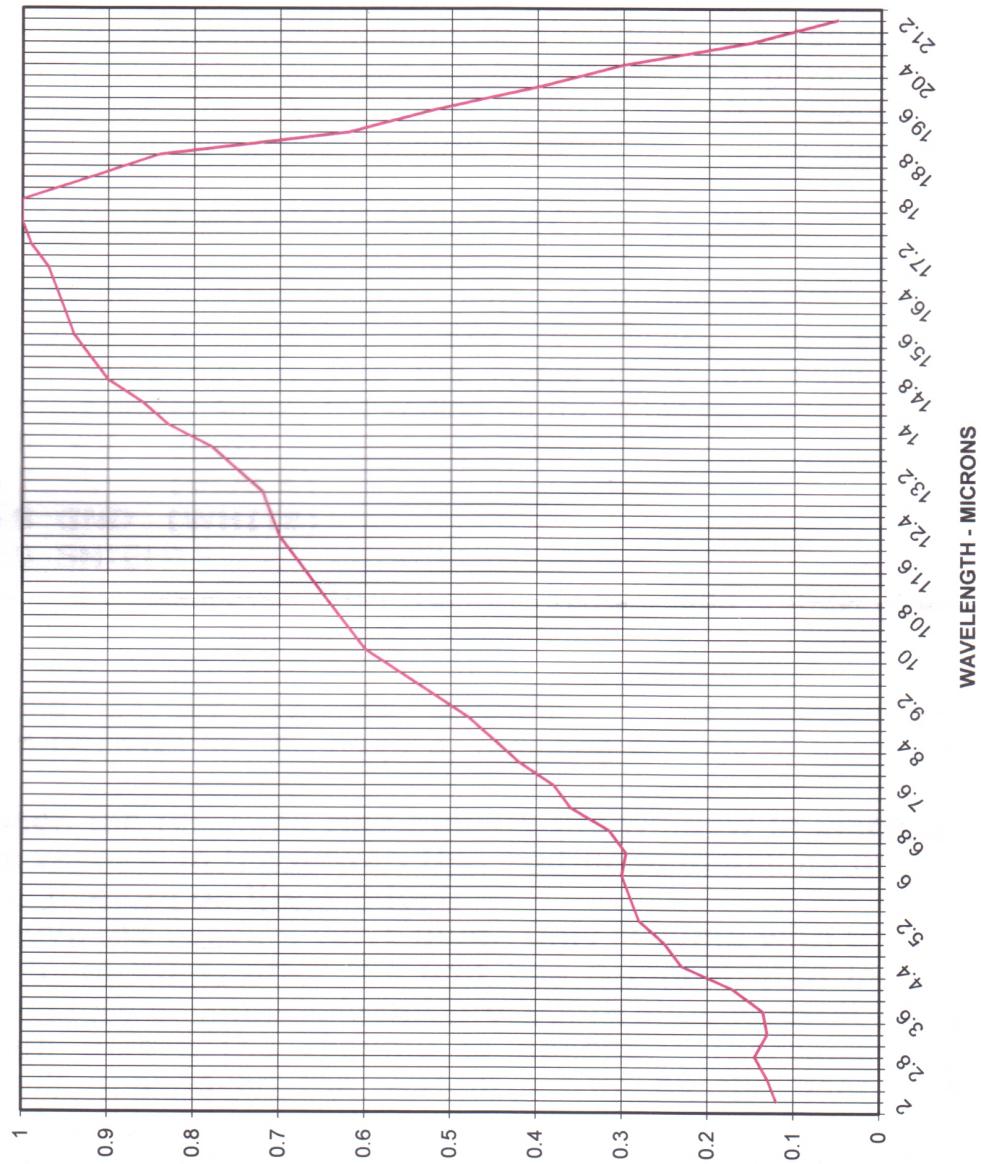
<b>Power Requirements</b>	+,- 5VDC to +,- 15VDC, 100mA
<b>Connections</b>	BNC signal coaxial cable with 3 lead shielded power cable. Red = +V, Black = -V, White/Shield = ground <b>Note:</b> A DB9 connector is provided on units purchased with optional PS-1 Low Noise Power Supply

Part No: MCTxx-E-LN Series

#### DB-9 PIN OUT

1	NO CONNECT	6	+V
2	NO CONNECT	7	-V
3	NO CONNECT	8	GND
4	NO CONNECT	9	CASE GND
5	NO CONNECT		

MCT (20)-010-E-LN6 - RELATIVE SPECTRAL RESPONSE  
s/n 021509



## L - Series Operating Instructions

This unit is a high performance liquid-nitrogen cooled IR detector / amplifier assembly. Please read these instructions carefully prior to operation.

### **CAUTION!**

*Carefully fill the metal dewar with liquid nitrogen using the included fill funnel. Filling too quickly causes the coolant to spurt out the fill port as a geyser. This results in significant cooling of the dewar body from the LN2 vapor. Instead, fill the dewar slowly over a several minute interval to reduce the geyser effect.*

### **DO NOT APPLY POWER WITHOUT THE DETECTOR AT 77K.**

The connection to the amplifier's signal output is through a BNC cable. Power is connected through a shielded cable terminated in a 9-pin Dsub connector which plugs directly into the Model PS-1 low noise power supply. For use without this power supply the coding on the cable is:

- Pin 6 +V (RED)
- Pin 7 -V (BLACK)
- Pin 8 GND (WHITE)
- Pin 9 SHIELD

The detector is sensitive to room lights and must be shielded anytime the power is on. The photodiode series (silicon, germanium, InGaAs, InAs and InSb) are DC coupled and output saturation can cause overheating and damage to the amplifier. The photoconductor series (PbS, PbSe and HgCdTe) are AC coupled, requiring a chopped beam for operation.

- **Do not loosen the retaining ring holding the window in place, as this may disturb the vacuum in the dewar. Use caution in installing or removing the black protective cap on the window.**
- **Do not remove the vacuum valve plug. Only repump with the proper valve operator, Model VO-1, after the unit has demonstrated loss of vacuum. The initial factory vacuum bakeout procedure should result in >12 months of operation before the repump is needed. Thereafter the repump schedule will depend on the system set-up by the user. Consult the factory for details and suggestions.**
- **Do not remove the backplate on the back of the dewar. Delicate wiring is inside.**

**NO USER SERVICEABLE PARTS ARE LOCATED INSIDE THE DEWAR.**

**OPENING THESE SPACES WILL VOID THE WARRANTY.**