



**Description**

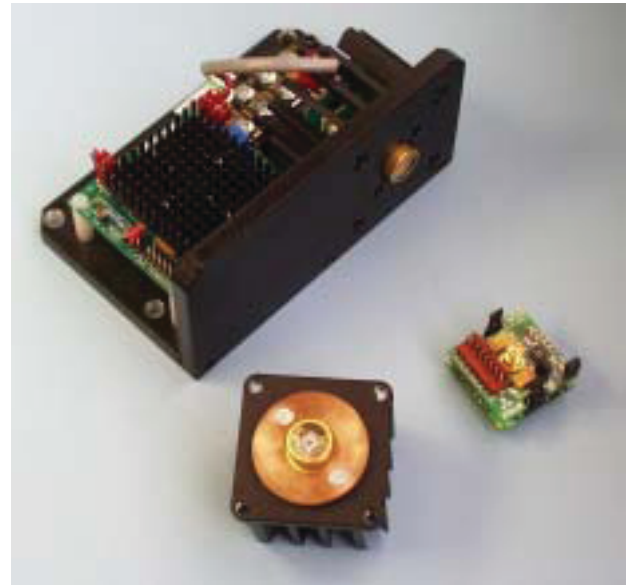
For proper operation, a thermoelectrically (TE) cooled detector needs to be mounted on a heat sink to dissipate the heat generated by the cooler and requires a temperature controller to hold the detector at a constant temperature. For signal amplification, the detector needs an external amplifier or, for a modular approach, an integrated preamplifier in the same assembly along with the detector and temperature controller. In the following sections, we will describe several configurations for our TE cooled accessories.

**HS1 Assembly  
(Heat Sink Assembly for TO-66  
and TO-3 Packages)**

The HS1 assembly is a detector mount with a heat sink and cables to integrate a TE cooled detector into an existing system with a preamp and temperature controller. The assembly comes with an SMA to BNC cable to connect the detector signal output to an external preamp and a cable to mate with either the TC-5 or TC-6 temperature controller (purchased separately).

**HSAMP Assembly  
(Heat Sink and Amplifier Assembly for  
TO-66 and TO-3 Packages)**

The HSAMP assembly is a detector mount with heat sink and signal amplification in one assembly. Teledyne Judson’s customer service personnel will assist customers in the selection of an appropriate preamplifier. (Please see Table 1 for preamp specifications.) The HSAMP includes a hybrid preamplifier (PA-5, PA-6 or PA-7), SMA to BNC cable for pre-amplifier signal output and a connector cable to mate with a TC-6 temperature controller (purchased separately). Customer provides power supply for preamplifier.



CMAMP and HSAMP Assemblies

HS1 Assembly/HSAMP Assembly

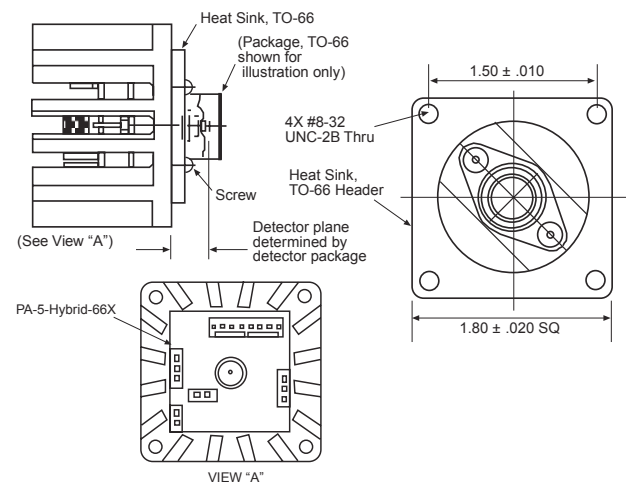


Figure 1

# THERMOELECTRIC COOLER ACCESSORIES

Table 1 - Preamplifier Specifications

Model	HSAMP1-TO66-TC6-PA5	HSAMP1-TO66-TC6-PA7	HSAMP1-TO66-TC6-PA6	Units	
Part Number	490114	490140	490198		
Description	Heat sink/Socket/PA-5 amplifier/Cables for TO-66 PV detectors/TC6 controller	Heat sink/Socket/PA-7 amplifier/Cables for TO-66 PV detectors/TC6 controller	Heat sink/Socket/PA-6 amplifier/Cables for TO-66 PV detectors/TC6 controller		
Transimpedance	High	$10^5$	$10^7$	$10^6$	V/A
Gain:	Med	$10^4$	$10^6$	$10^5$	
(Switch Selected)	Low	$10^3$	$10^5$	$10^4$	
Bandwidth	@ High Gain	200	8	60	KHz
$R_D > 10K, C_D < 0.2nF$	@ Med Gain	200	60	150	
	@ Low Gain	200	150	200	
Input Offset Voltage ( $V_{os}$ )		$\pm 80$	$\pm 500$	$\pm 100$	$\mu V$
Input Offset Voltage Drift		--	2.5	1.8	$\mu V/^\circ C$
Input Bias Current ( $i_b$ )		$\pm 180$	$\pm 0.1$	$\pm 80$	nA
Voltage Noise Density ( $e_n$ )@1KHz		1.2	5.6	4.5	nV/ Hz
Voltage Noise from 0.1 to 10Hz		.09	0.8	0.25	$\mu V$
Current Noise Density ( $i_n$ )@1KHz†		1.8	--	0.6	pA/ Hz
Current Noise Bandwidth = 0.1Hz to 10Hz		--	48	--	fA <sub>p-p</sub>
Max. Bias V Adj.		N/A	N/A	N/A	V
Output Impedance	$< 100$				
Maximum Output Voltage	$\pm 10V$				p-p
Power Requirements	$+15V$ and $-15V @ 10mA$				
Recommended for Detector Series:	J12, J12TE1	J12TE2, J16 Series	J12TE2, J16 Series		

† At high gain setting

# THERMOELECTRIC COOLER ACCESSORIES

## CM21 Assembly (Heat Sink and Temperature Controller for TO-66 and TO-3 Packages)

The CM21 assembly is a detector mount with heat sink and temperature controller incorporated into a black anodized aluminum bench mount assembly (Figure 2). The CM21 is fully wired with a TC-6 temperature controller and comes with SMA to BNC cable to connect the detector signal output to an external preamplifier. Customer provides power supply for the temperature controller.

### Gain Selection for PA5, PA6 and PA7 Models

GAIN SELECTION	
JUMPER	GAIN
JXB - J2B, JXA - J2A	LOW
JXB - J1B, JXA - J1A	MED
NONE	HIGH

Note: J3A and J3B normally installed. An additional gain of two (2) is available if both jumpers are removed.

## CMAMP Assembly (Heat Sink Amplifier and Temperature Controller for TO-66 and TO-3 Packages)

The CMAMP assembly is designed for customers that would like a fully integrated detector module. It includes a heat sink, preamplifier and temperature controller all mounted in a black anodized aluminum bench mount assembly (Figure 2). The assembly is supplied fully wired with TC-6 temperature controller, hybrid preamplifier (PA-5, PA-6 or PA-7) and SMA to BNC pre-amplifier signal output cable. Teledyne Judson's customer service personnel will assist customers in the selection of an appropriate preamplifier. (Please see Table 1 for preamp specifications). The CMAMP assembly requires an external power supply that provides both +5V @ 2.0 amperes for the temperature controller and ±15 volts at 100mA for the preamplifier. The CMAMP assembly is an ideal platform for evaluating TE cooled detectors for the first time. Custom mechanical assemblies including temperature control, detector amplification and heat sinking are available on an OEM basis.

### CM21 Assembly / CMAMP Assembly

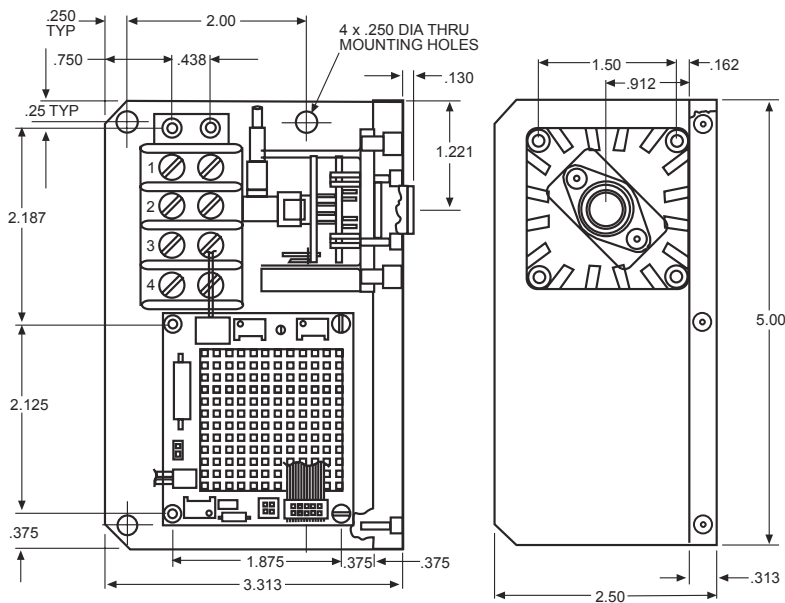


Figure 2

### Specifications:

Please refer to Table 1 for preamplifier specifications and Table 2 for accessory options.



Table 3 - Thermoelectric Cooler Accessories Selection Table

Model Number	Part Number	Heat sink	Package Socket	Cables	Amplifier *	Temp. Controller	Power Requirements	
HS1	600613-1	HS1	9 pin TO-66 66G, 66S, 66C, 66GE, 66D	N/A	N/A	N/A	N/A	
HS1-T066-TC6	490117			Detector-BNC Cooler to TC6				
HS1-T066-TC5	490094			Detector-BNC Cooler to TC5				
HS1-3CN-TC6	490120		8 pin TO-3 3CN					
HS1-3C12-TC6	490151		3C12					
HS1-T066-TC6-PS	490138		Detector-Lemo Cooler to TC6					
HSAMP-T066-TC6-PA5	490114		9 pin TO-66 66G, 66S, 66C, 66GE, 66D	From Amp SMA to BNC Cooler to TC6	PA-5-HYBRID			Preamp +/-15V @10mA
HSAMP-T066-TC6-PA6	490147				PA-6-HYBRID			
HSAMP-T066-TC6-PA7	490140				PA-7-HYBRID			
HSAMP-3CN-TC6-PA7	490143		8 pin 3CN					
CM21 ASSEMBLY-TO66	490102	CM1	9 pin TO-66 66X	Detector-BNC	N/A	TC6	TC-6 +5V +/- .25 @ 2A	
CM21 ASSEMBLY-TO66-PS	490118			Detector-Lemo				
CM21 ASSEMBLY-3CN	490122		8pin 3CN					
CM21 ASSEMBLY-3C12	490150		12 pin TO-3					
CMAMP-T066-PA5	490130		9 pin TO-66 66X	12" RG174 SMA-BNC	PA-5-HYBRID		TC-6 +5V +/- .25 @ 2A +/-15V@10mA Preamp	
CMAMP-T066-PA6	490146				PA-6-HYBRID			
CMAMP-T066-PA7	490139				PA-7-HYBRID			
CMAMP-3CN-PA5	490132		8 pin TO-3 3CN	PA-5-HYBRID				
CMAMP-3CN-PA7	490141			PA-7-HYBRID				

\* Please refer to Table 1 for preamp specifications.

Information in this document is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject to change without notice.