

# Boston Electronics Corporation

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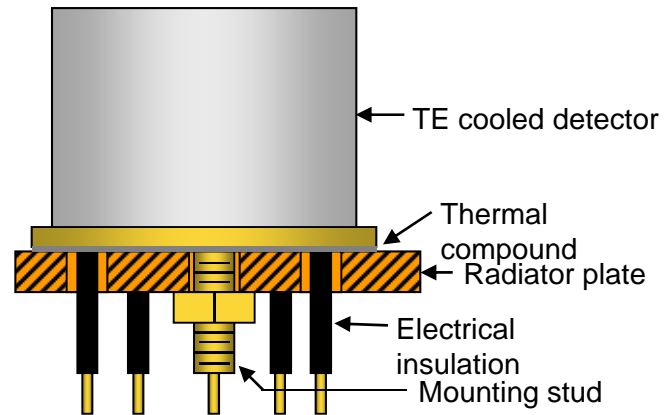
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## Mounting, amplifying and controlling VIGO thermoelectrically cooled Detectors PC(I)-nTE-series and PV(I)-nTE-series

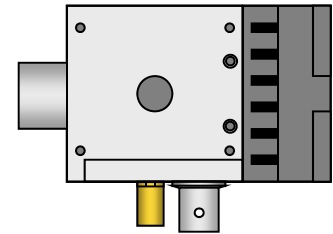
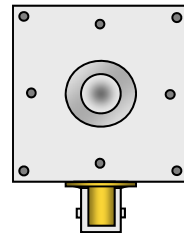
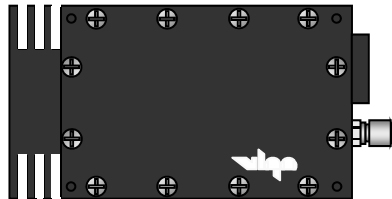
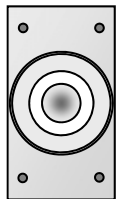
### Mounting and Heat Sinking

1. Do it yourself - Drill holes for the leads and mounting stud in a thermally conductive plate and apply thermally conductive compound between the detector and plate. Use the 2-56 UNC stud to hold the parts securely together. Make sure the leads do not touch the metallic plate. Thermal conductance should be better than  $2\text{ C}^\circ/\text{W}$  for a two-stage cooled device and better than  $3\text{ C}^\circ/\text{W}$  for a three-stage cooled device. See illustration at right.



To insure proper heat extraction from the detector it is important to pick the proper size heat sink.

2. Let us do it for you - We can supply the detector mounted a heat sink. The heat sink can have a detector and preamplifier mounted inside, tested at the factory, and test data supplied. The DR series of passive heat sinks are useful for detectors with two-stage TE coolers but we prefer the more compact MxPxC and MxPxC-F heat sinks. The MxPxC-F is required for the three-stage cooled detectors. The MxPxC-F includes a fan for greater heat dissipation capability.



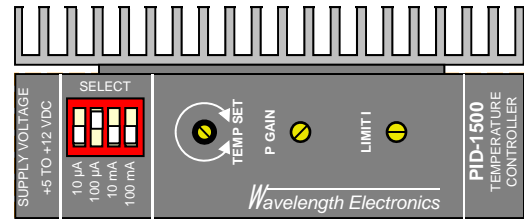
MxPxC - Compact, passive heat sink

MxPxC-F - Compact, fan-assisted heat sink

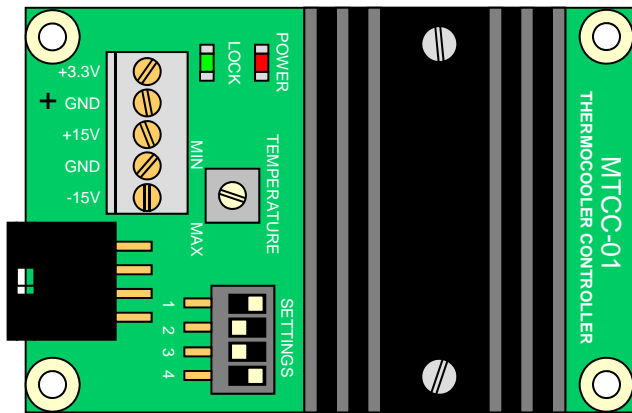
### Powering the TE cooler and controlling its temperature

1. Do it yourself - We supply the details of the maximum current and voltage for the TE cooler with each detector or detector built into a heat sink and you are on your own.

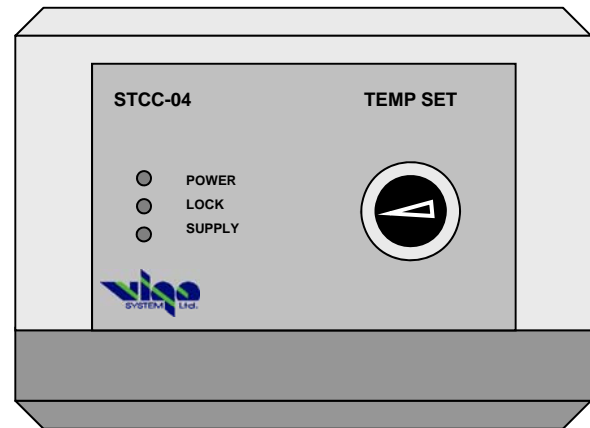
2. Make one at board level – We can supply TE-cooler components. In particular, we can supply the Wavelength Electronics PID 1500. See illustration at right. This is a big advantage over a purely do-it-yourself project. There are other manufacturers of similar products that can be used for this application.



3. Buy our controller – Actually, we have two choices. The MTCC-01 is a miniature, board level unit that is ideal for applications where space is at a premium and the STCC-04 which is intended for use on the lab bench that plugs into local AC power and is “plug and play” ready.



MTCC-01 – Miniature controller



STCC-04 – Bench-top controller

## Amplifying

1. Do it yourself – Not recommended for the beginner as it is difficult to make an amplifier that has sufficiently low noise.

2. Buy an external amplifier – An external amplifier is always needed when you choose the do-it-yourself mounting/heat sinking option. Our amplifiers are manufactured to match the detector to which it will be mated. We have excellent, compact (2”x2”x1”), stand-alone, transimpedance amplifiers which are made in the USA by Perry Amplifier Co. These normally can be delivered in two to three weeks to match detectors, either unmounted or mounted on any heat sink we supply. AC-coupled versions are available from 1 to 500 MHz and DC-coupled versions are available up to 200 MHz.

3. Buy an integrated amplifier – We also supply preamplifiers manufactured by VIGO that fit inside the DR-1, DR-10, MIPxC, or MIPxC-F heat sinks. These are normally transimpedance amplifiers and when integrated with the heat sinks they become the VPAC-xxI, VPDC-xxI, MIPAC-xx, MIPDC-xx, MIPAC-F-xx, or MIPDC-F-xx models. The DR-1 heat sink is used for AC- or DC-coupled amplifiers with a frequency response of up to 20 MHz. The DR-10 is used for AC- or DC-coupled amplifiers with a frequency response of 50 MHz to 250 MHz.

AC-coupled amplifiers with a frequency response of 1 GHz are available but have a special heat sink that is unique to this amplifier.

Additional information is available on our web site. Please call or send an e-mail if you have any questions.