



The PowerCool Series direct-to-air thermoelectric assembly is a high performance thermoelectric based heat pump. It is designed to temperature control small chambers used in medical diagnostics or sample storage compartments in analytical instrumentation. This unique design offers a high performance hot side heat dissipation mechanism that convects heat more efficiently than conventional heat exchanger technologies.

The design utilizes custom thermoelectric modules to maximize cooling capacity and premium grade fans to reduce noise. Moisture resistant insulation is used to keep condensation from penetrating into the TEM cavity. This unit operates on 48 VDC and is designed for indoor lab use environment. Custom configurations available upon request.

Laird Manufacturer Part Number: 387002415

FEATURES

- High Performance
- Compact Form Factor
- Reliable Solid-State Operation
- RoHS Compliant

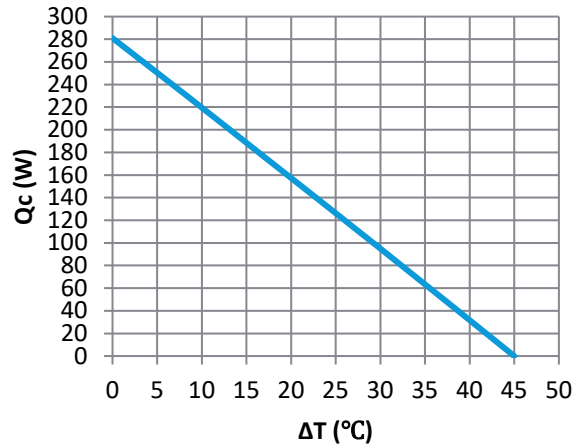
APPLICATIONS

- Analytical storage compartment temperature control
- Medical diagnostic chamber refrigeration

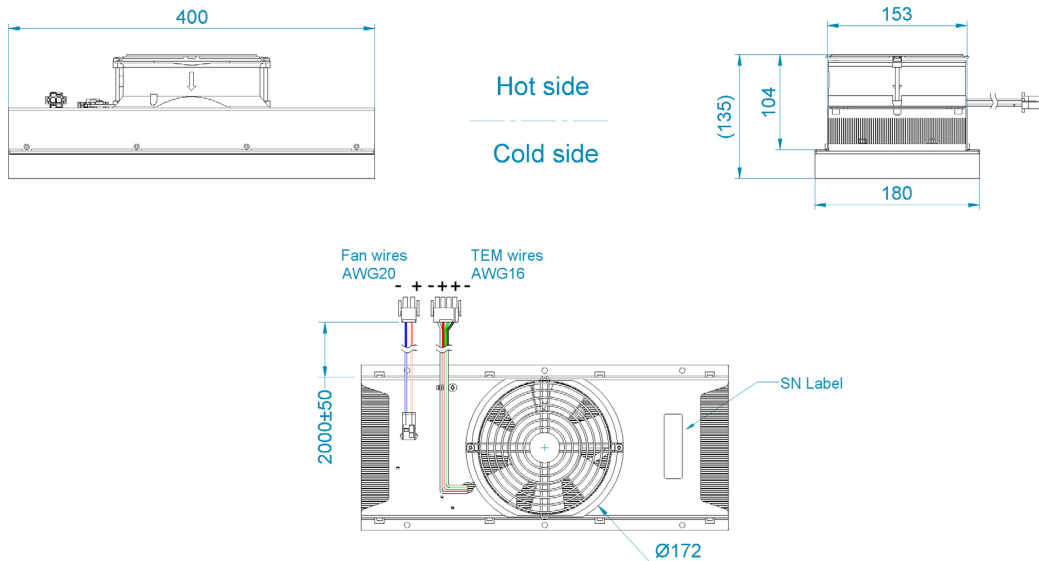
| TECHNICAL SPECIFICATIONS | |
|---|--------------------------|
| TEA Model | DA-280-48-02-00-00 |
| Heat Transfer, Cold Side | Direct |
| Heat Transfer, Hot Side | Air |
| Cooling Power @ $\Delta T=0^{\circ}\text{C}$ and $T_a=25^{\circ}\text{C}$, Tolerance $\pm 10\%$ - W | 281 |
| TEM Input Power | |
| Voltage, Nominal, - VDC | 48 |
| Current, Nominal/Initial @ $\Delta T=0^{\circ}\text{C}$ and $T_a=25^{\circ}\text{C}$, Tolerance $\pm 10\%$ - A | 5.6/6.5 |
| Fan Input Power | |
| Voltage, Nominal - VDC | 24 |
| Current, Nominal - A | 0.7 |
| Fan Noise - dBA | 60 |
| Dimensions (L x W x H) - mm | |
| Weight - kg | 6.194 |
| Operating Temperature - $^{\circ}\text{C}$ | -20 to 55 |
| Packaging | Individual cardboard box |

PERFORMANCE QC VS ΔT

TEA performance at Ta=25°C



ISOMETRIC DRAWINGS



ELECTRICAL CONNECTIONS 48 VDC (CAGE CLAMP)

| OBJECT | WIRE TYPE | COLOR | POLE |
|--------|-----------|-------|------|
| TEM + | 18 AWG | Red | 1 |
| TEM - | | Black | 2 |
| FAN + | | Red | 3 |
| FAN - | | Black | 4 |



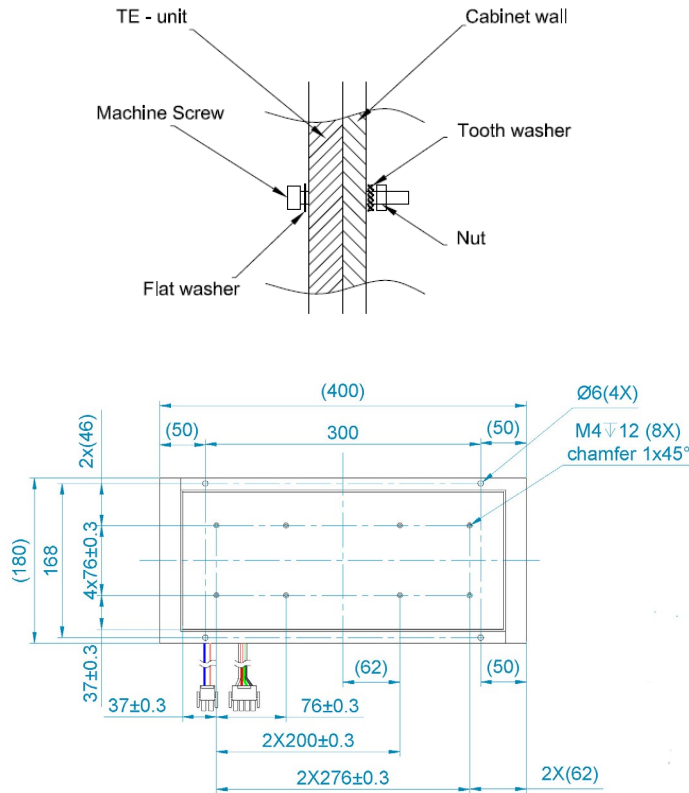
Warning: Do not reverse current or use PWM-regulation on fan supply.

SERVICE

Units are generally maintenance free, however occasionally it is recommended to clean the heat sinks and fans of debris. This is best done with compressed air.

INSTALLATION INSTRUCTIONS

1. The TE assembly must be protected from external force or violence.
2. The power line to the assembly needs to be protected by a fuse. The fuse rating should be of at least the nominal current of the assembly 150% of rated current for at least 60 seconds. This is valid at $T_a=35^{\circ}\text{C}$. Fuse ratings for other ambient temperatures ($X^{\circ}\text{C}$) can be calculated $I[X^{\circ}\text{C}]=I[35^{\circ}\text{C}]/(1+0.005*(X-35))$. This is valid when regulating with an ON/OFF regulation. At rapid temperature cycling where this is applied, need for even higher fuse ratings.
3. Cooled parts need to be isolated from air humidity to minimize risk for condensation and thermally insulated for best performance.
4. Max ripple on supplied power =5%.
5. Switching power to TEMs at frequencies between 0.01 Hz to 5 kHz will render premature failure of modules and must be avoided.



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