

The DA PowerCool Series is a Direct-to-Air thermoelectric assembly (TEA) that uses impingement flow to transfer heat. It offers dependable, compact performance by cooling objects via conduction. Heat is absorbed through a cold plate and dissipated thru a high density heat exchanger equipped with an air ducted shroud and brand name fan. The thermoelectric modules are custom designed to achieve a high coefficient of performance (COP) to minimize power consumption. This product series is available in a wide range of cooling capacities and voltages. Custom configurations and moisture protection options are available, however, MOQ applies.

Laird Manufacturer Part Number: DA-051-24-02-00-00

Patent Pending

#### FEATURES

- Compact design
- Precise temperature control
- Reliable solid-state operation
- DC operation
- RoHS Compliant

#### APPLICATIONS

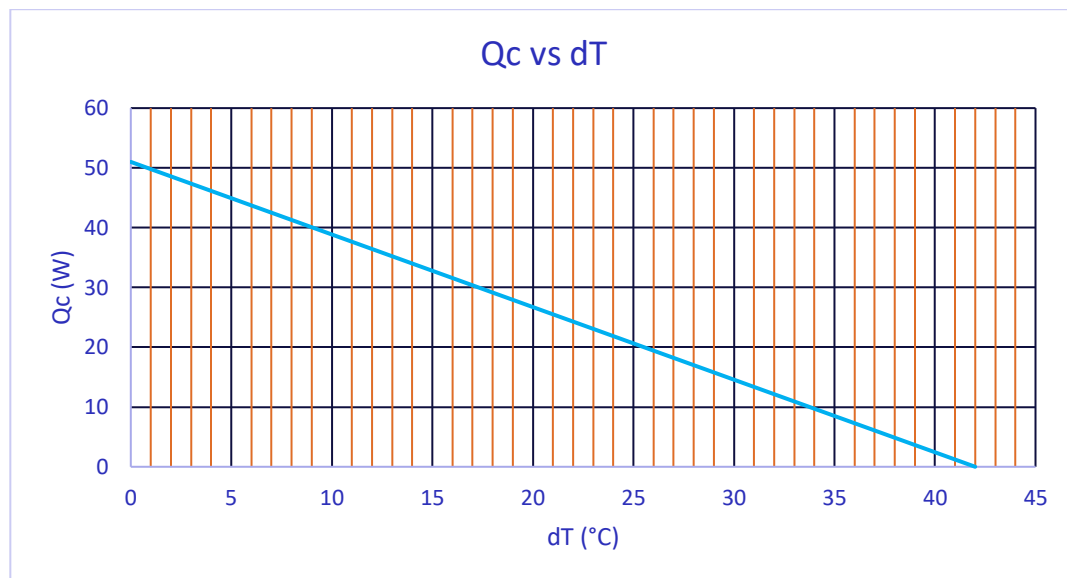
- Analytical instrumentation
- Medical diagnostics
- Photonics laser systems
- Industrial instrumentation
- Food and beverage cooling

#### TECHNICAL SPECIFICATIONS

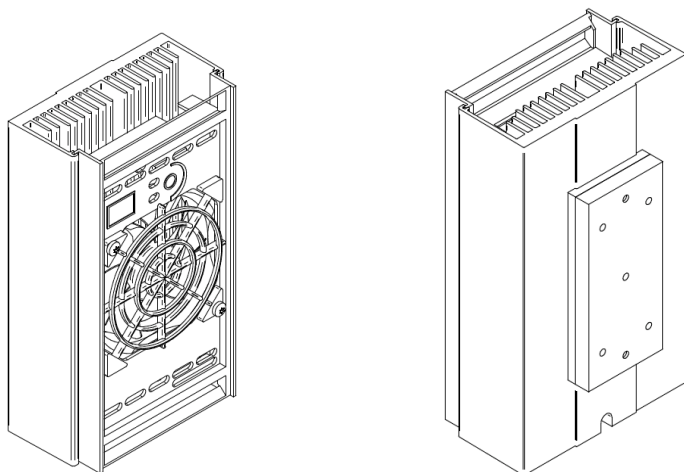
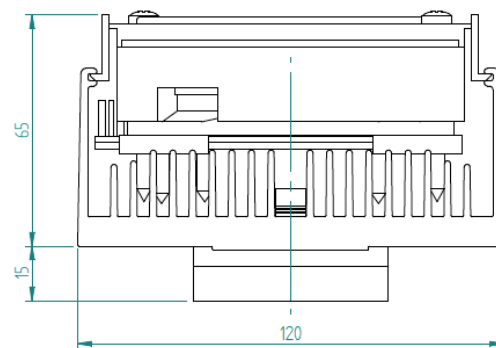
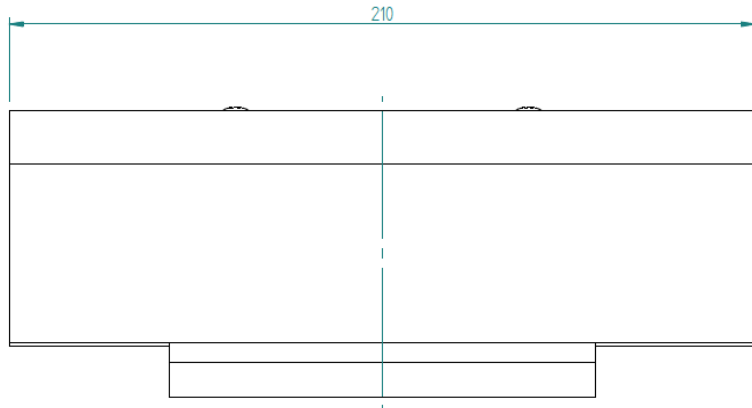
TEA Model	DA-051-24-02-00-00
Heat Transfer, Cold Side	Direct
Heat Transfer, Hot Side	Air
Cooling Power	51W @ $\Delta T=0^{\circ}\text{C}$ and $T_a=35^{\circ}\text{C}$ , Tolerance $\pm 10\%$
TEM Input Power	
Voltage, Nominal	24 VDC
Current, Nominal/Initial	2.7/3.1 Amps @ $\Delta T=0^{\circ}\text{C}$
Fan Input Power	
Voltage, Nominal	24 VDC
Current, Nominal (Hot Side)	0.15 Amps
Fan Noise	35 dBA
MTBF (fans - hrs)	50,000 hrs
Dimension (L x W x H)	210 x 120 x 80 mm
Weight	1.53 kg
Operating Temperature	$-10^{\circ}\text{C}$ to $46^{\circ}\text{C}$
Packaging	Individual cardboard box

## PERFORMANCE CURVES

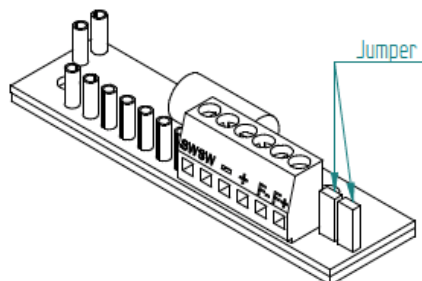
TEA performance at  $T_a=35^{\circ}\text{C}$



## ISOMETRIC DRAWINGS



## ELECTRICAL CONNECTIONS



### Electrical connections:

To use separate supply:  
Mount jumpers to not short-cut the pin pairs.

Connect:

"+" : + TEM

"-" : - TEM

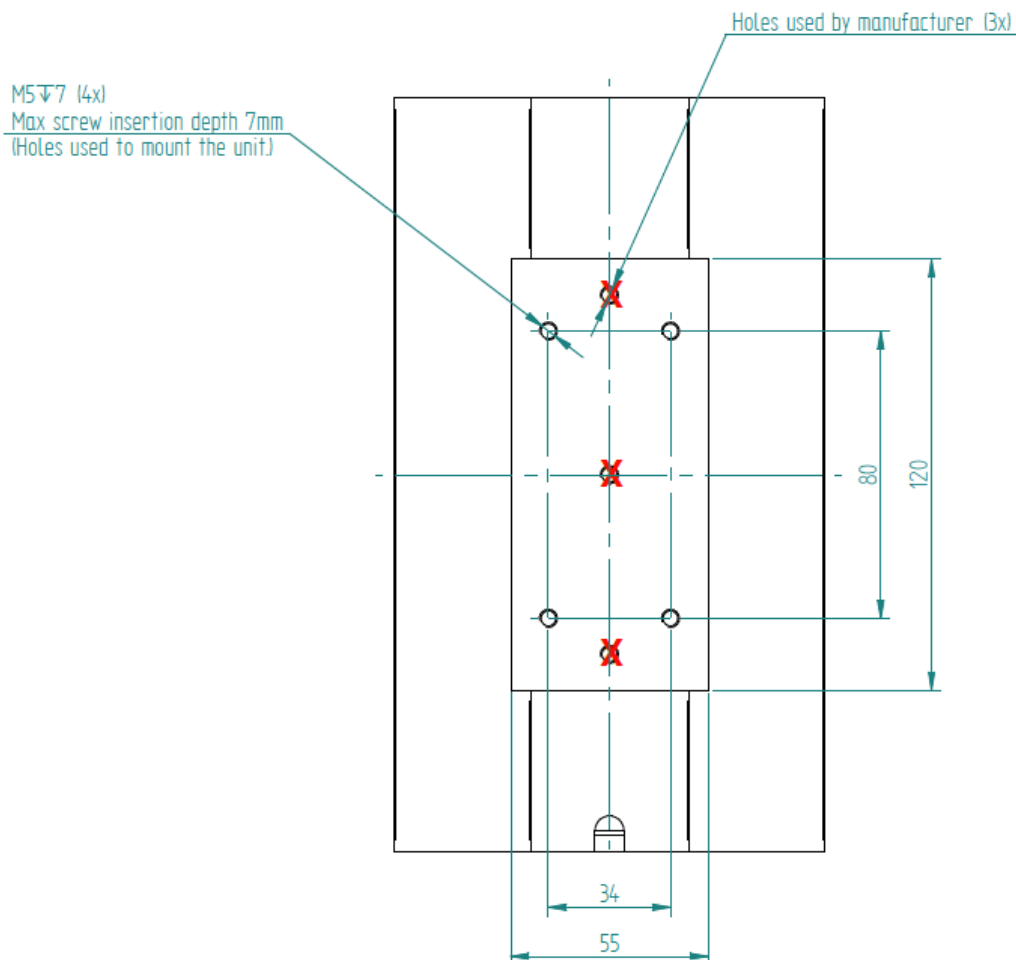
"F+" : + Fan(s)

"F-" : - Fan(s)

To use single supply:  
Mount jumpers to short-cut the pin pairs.  
Connect the unit to "+" & "-".

Warning: Single supply not applicable in heating mode or with PWM-regulation.

## INSTALLATION and SERVICE 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. It must withstand 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 with the formula  $I[x^{\circ}\text{C}]=I[35^{\circ}\text{C}]/(1+0.005*(x-35))$ . This is valid when regulating with an ON/OFF regulation. At rapid temperature cycling where this is applicable, there can be need for even higher fuse ratings.
3. Cooled parts needs 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.

### SERVICE

Fan impellers and heat sinks must be cleaned on regular intervals to reduce risk for overheating and reduction of cooling function. The interval may vary depending on environment.



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