TEconversion.com
THERMOELECTRIC CONVERSION SYSTEMS

AC Series

June 2022

AC-180-40

180W Air-to-Air Thermoelectric Cooling System

Quick Description

The AC-180-40 is a compact air-to-air thermoelectric cooler with integrated hot and cold-side fans. The unit is formed around a 200mm x 280mm x 36mm dense fin aluminium heatsink extrusion. The hot side has a pair of 120mm x 120mm x 38mm fans blowing air at the fins. On the opposite side the Peltier modules are held on the extrusions by an aluminium heatsink (125mm x 250mm x 45mm) and a single 120mm x 120mm x 25mm cooling fan. The rear face of the hot-side extrusion is covered with a layer of closed-cell neoprene. The unit has a cooling capacity of 180W and a ΔT(max) of 40°C and is

particularly well suited to applications where a low temperature is required with a modest overall heat load. The 120mm x 38mm fans input power is 36W and the 120mm x 25mm fan input power is 5W.

The unit uses a total of four Peltier modules. These can be wired for 12V, 24V or 48V operation. The fan voltage is fixed and must be specified when ordering.

Notes:

1. Both fans and the Peltier modules are electrically isolated from the extrusion.
2. The cooler can be used as a heater by polarity reversal of the Peltier module current.
3. ΔT is $T_{ambient} - T_{cold}$. Where $T_{ambient}$ = 41°C

Thermal Performance

Operating Parameters: AC-180-40

Qc [W]	180	0
ΔT	0	40
TEC V [V]	12 / 24 / 48	
TEC I [A]	40 / 20 / 10	
TEC P [W]	480	

**Measured at ambient temperature of 41°C*

This unit is designed for indoor use. Higher IP ratings are available upon request.

Hot Side Fan

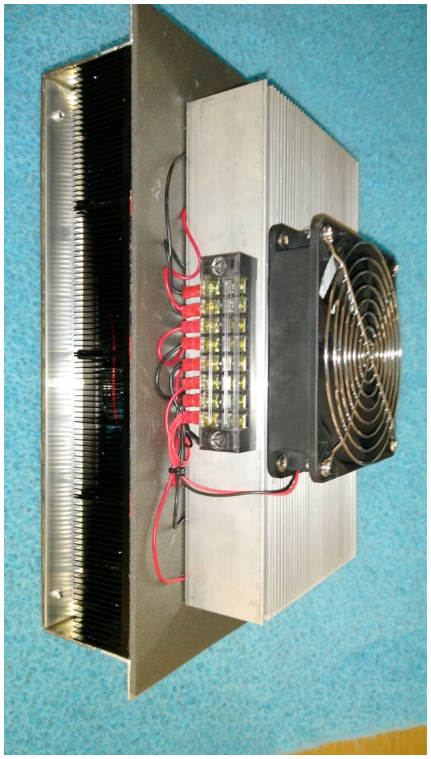
Voltage [V]	6 – 14 / 10 – 26 / 24 – 55
Current [A]	1.6 / 0.8 / 0.4
Power [W]	19
Wiring: Red	Power +12 / +24V / +48V
Wiring: Black	Negative/Ground

Cold Side Fan

Voltage [V]	6 – 14 / 10 – 26 / 24 - 55
Current [A]	0.42 / 0.21 / 0.11
Power [W]	5W
Wiring: Red	Power +12 / +24V / +48V
Wiring Black	Negative/Ground

- The cold side fan can be used over the voltage ranges 6-14V for '12V'; 10V to 26V for '24V' and 24-55V for '48V'. This gives a speed range of approximately 4:1. ΔT(max) is measured with a fan operating voltage of 6V/10V/24V. A slightly lower temperature is available from the unit if the fan is switched off entirely.
- NOTE: Providing there is no condensate build-up on the cold side extrusion the unit can be operated in any orientation. If there is a possibility of condensate forming then the unit should be mounted in such a way that condensate cannot fall on to the cold-side fan. If the unit is to be operated below 0°C for extended periods it is recommended the TCS thermoelectric de-humidifier unit is used in conjunction with the AC-180-40 to prevent excessive frost build up. Alternatively, the cooler controller should be programmed with a defrost cycle.

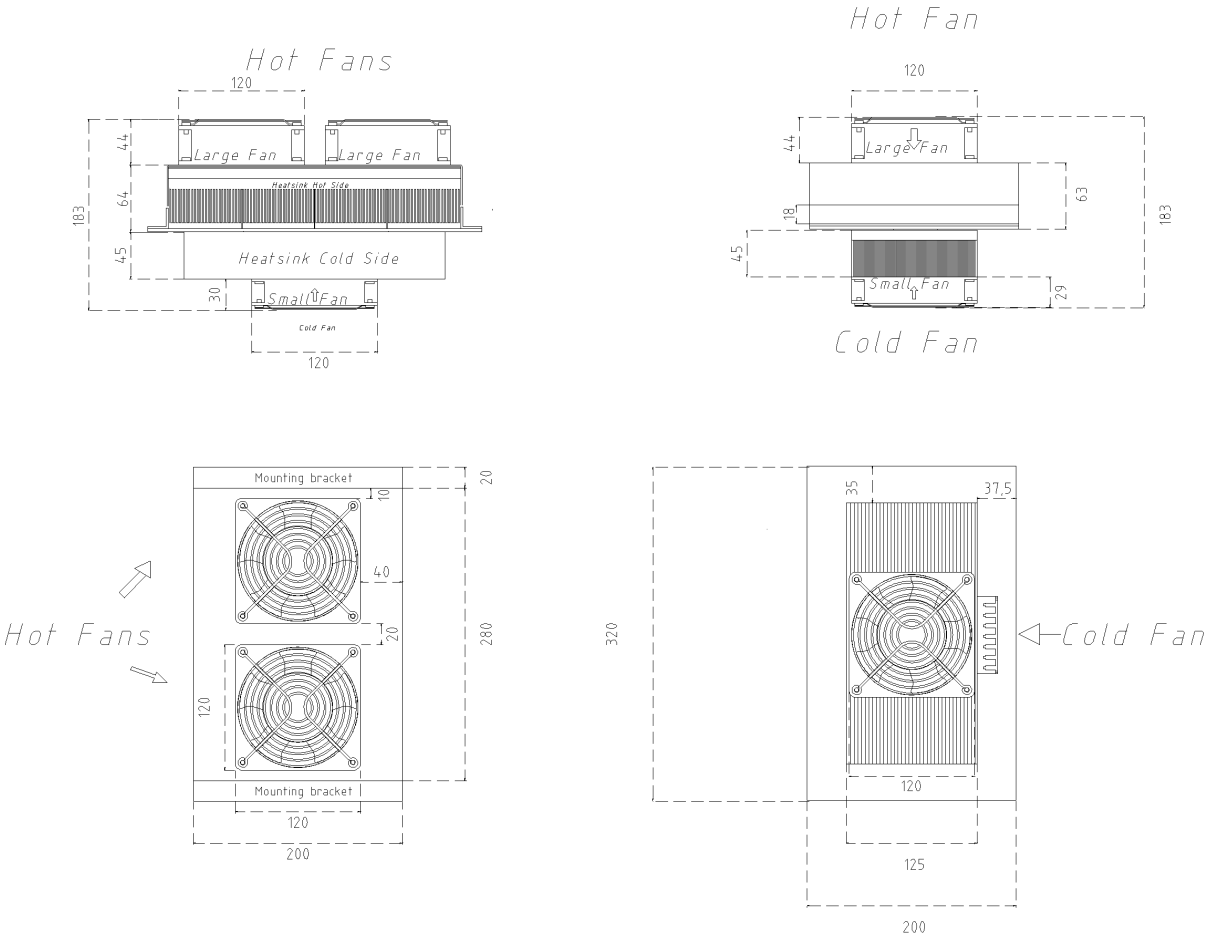
Wiring Diagram



Terminal numbering as shown in picture.
Reading Top to Bottom: 1 → 8
Wired for 24V DC Operation.

Terminal	Function	Colour	Voltage
1	TEGs 1&2 -VE	Black	0V
2	[series conn]	N/A	N/A
3	TEGs 1&2 +VE	Red	24V
4	TEGs 3&4 -VE	Black	0V
5	[series conn]	N/A	N/A
6	TEGs 3&4 +VE	Red	24V
7	Fan -ve	Black	0V
8	Fan +ve	Red	24V

Mechanical Drawings



Notes:

1. Cutout for mounting cold side TCS AC-180-40 Cooler assembly to be 255mm x 145mm.
2. Cutout for mounting hot side TCS AC-180-40 Cooler assembly to be 285mm x 201mm.
3. TCS AC-180-40 Cooler secured in chassis using mounting brackets drilled to suit.
4. Rear of hot side of extrusion covered with a layer of closed-cell neoprene.
5. The initial current drawn by the unit is ~ 20% higher than the operating current.

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