

AC-series: Thermoelectric Coolers

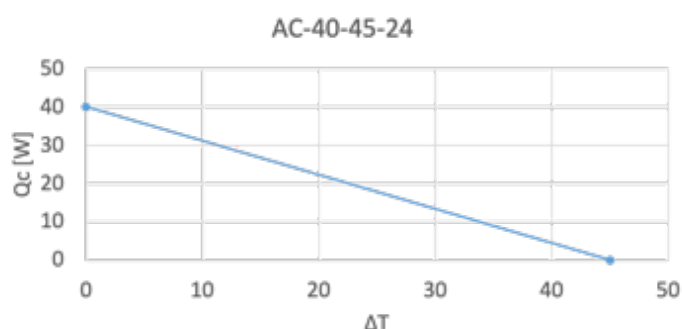


AC Series

Revised October 2020

AC-40-45

40W Air-to-Air Thermoelectric Cooling System



Quick Description

The AC-40-45 is a compact air-to-air thermoelectric cooler with integrated hot and cold-side fans. The unit is formed around a 150mm x 120mm x 25mm dense fin aluminium heatsink extrusion. The cold side has a 80mm x 80mm x 38mm fan blowing air at the fins. On the opposite side the Peltier module is held on the extrusion by an aluminium heatsink (80mm x 70mm x 26mm) and a 70mm x 70mm x 20mm cooling fan. The rear face of the extrusion is covered with a layer of closed-cell neoprene. The unit has a cooling capacity of 40W and a $\Delta T(\text{max})$ of 45°C and is particularly well suited to applications where a very low temperature is required with a modest overall heat load. The 70mm fan input power is 1.6W @ 24 V DC.

Notes:

1. Both fans and the Peltier module 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 $T_{\text{ambient}} - T_{\text{cold}}$. Where $T_{\text{ambient}} = 41^\circ\text{C}$

AC-series: Thermoelectric Coolers

Thermal Performance

Operating Parameters: AC-40-45		
TEC size 40mm x 40mm		
Qc [W]	41	0
ΔT	0	45
TEC V [V]	24	
TEC I [A]	5	
TEC P [W]	120	

**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]	10 – 26
Current [A]	0.06
Power [W]	1.6
Wiring: Red	Power +24V
Wiring Black	Negative/Ground

Cold Side Fan

Voltage [V]	10 – 26
Current [A]	0.45
Power [W]	12
Wiring: Red	Power +24V
Wiring Black	Negative/Ground

- The cold side fan can be used over the voltage range 10V to 26V. This gives a speed range of approximately 4:1. $\Delta T(\max)$ is measured with a fan operating voltage of 10V. 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-40-45 to prevent excessive frost build up.

Wiring Diagram

Terminal numbering as shown in picture.
Reading Left to Right: 1->6

Terminal:	1	2	3	4	5	6
	Hot Side Fan	Hot Side Fan	Cold Side Fan	Cold Side Fan	TEC	TEC
Colour:	Red	Black	Red	Black	Red	Black

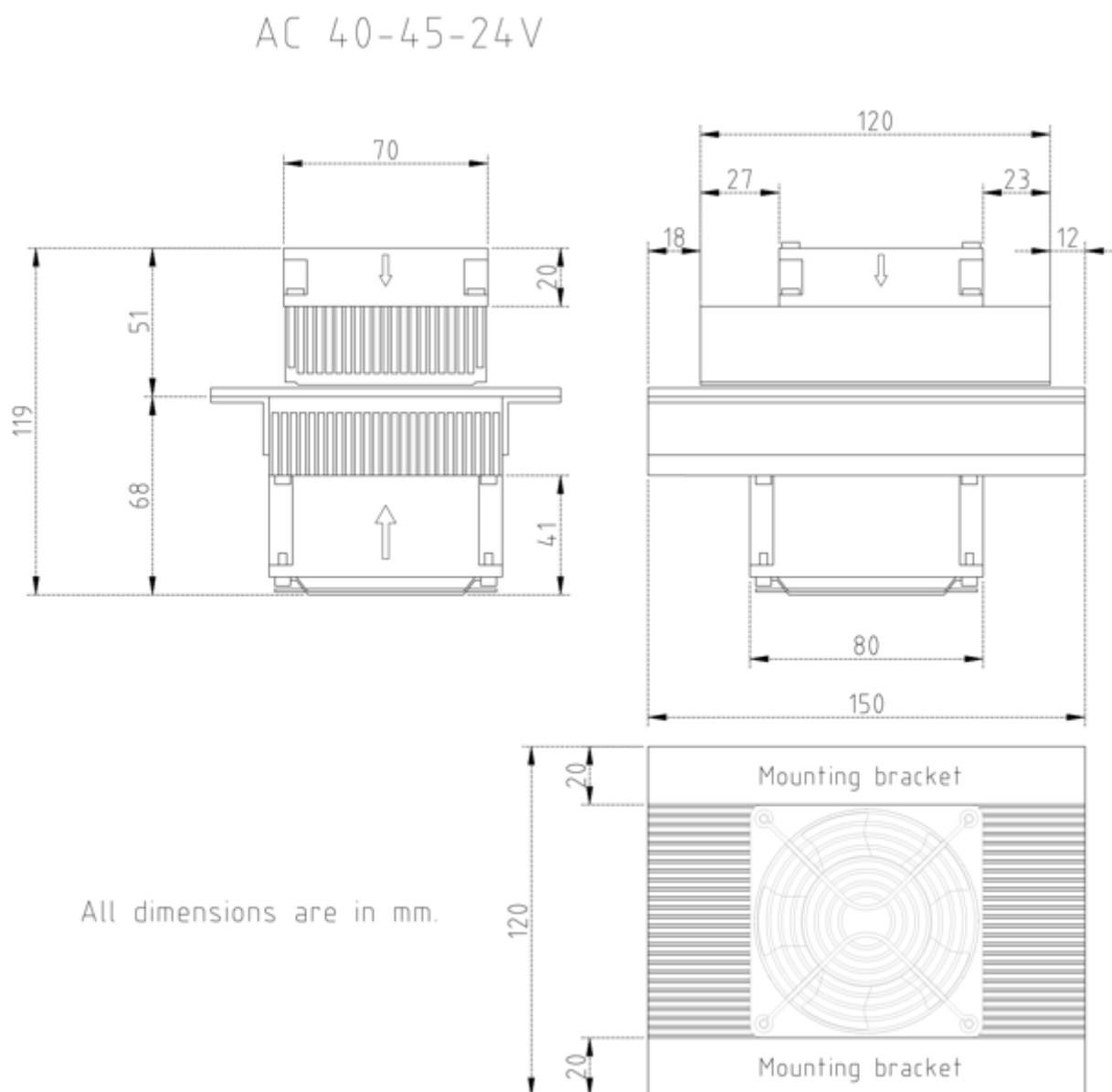
AC-series: Thermoelectric Coolers



Voltage:	24V	0V	24V	0V	24V	0V
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Mechanical Drawings



Notes:

1. Cutout for cold side TCS AC-45-40 Cooler assembly to be 70mm x 80mm.
2. TCS AC-40-45 Cooler mounted in chassis using 4 x 4.0mm self-tapping screws.
3. Hot side of extrusion covered with a layer of closed-cell neoprene.
4. The initial current drawn by the unit is ~ 20% higher than the operating current.

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This TCS product is not authorised for use as critical component in life support devices.

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