

**Annular SH Series Thermoelectric Cooler**

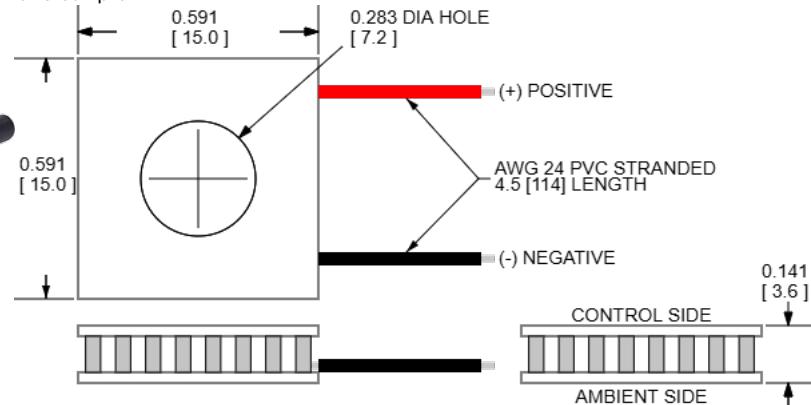
The SH10-23-06-L1-W4.5 is an annular-style thermoelectric cooler. The hot and cold side ceramics have a circular hole in the center to accommodate light protrusion for optics, mechanical fastening or temperature probe. It has a maximum  $Q_c$  of 4.6 Watts when  $\Delta T = 0$  and a maximum  $\Delta T$  of 70.5 °C at  $Q_c = 0$ .

**Features**

- Center Hole
- Precise Temperature Control
- No sound or vibration
- Reliable solid-state
- DC Operation
- RoHS-compliant

**Applications**

- Thermoelectric Coolers for Reagent Storage
- Thermoelectric Coolers for Handheld Cosmetic Lasers
- Cooling for Centrifuges
- Peltier Cooling for Machine Vision



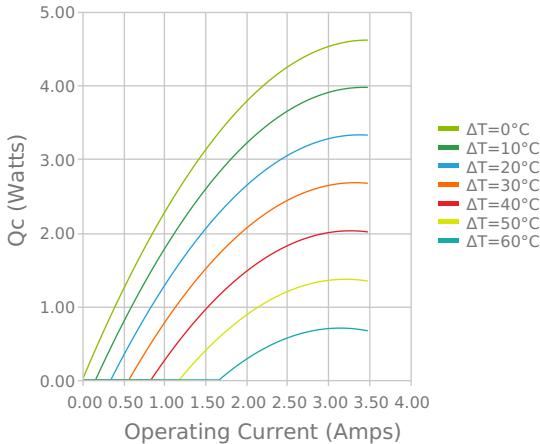
CERAMIC MATERIAL:  $\text{Al}_2\text{O}_3$   
SOLDER CONSTRUCTION: 138°C, BiSn

INCHES [ MM ]

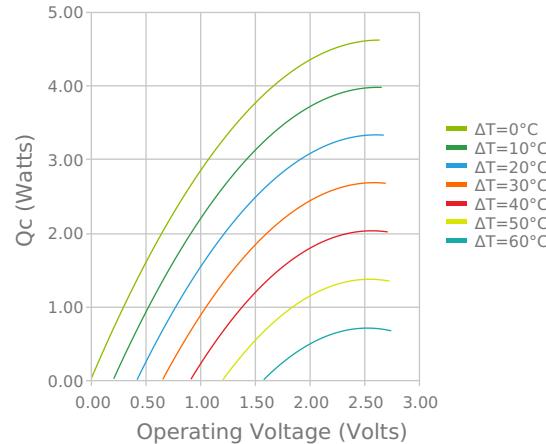
**Electrical and Thermal Performance**

For maximum performance, be sure to orient the CONTROL side of the TEC against the application to be managed and the AMBIENT side against the heat sink or other heat rejection method. The CONTROL side is always opposite the side with lead attachments. Lead attachment is a passive heat loss and less impactful if located on the side that attaches to the heat exchanger.

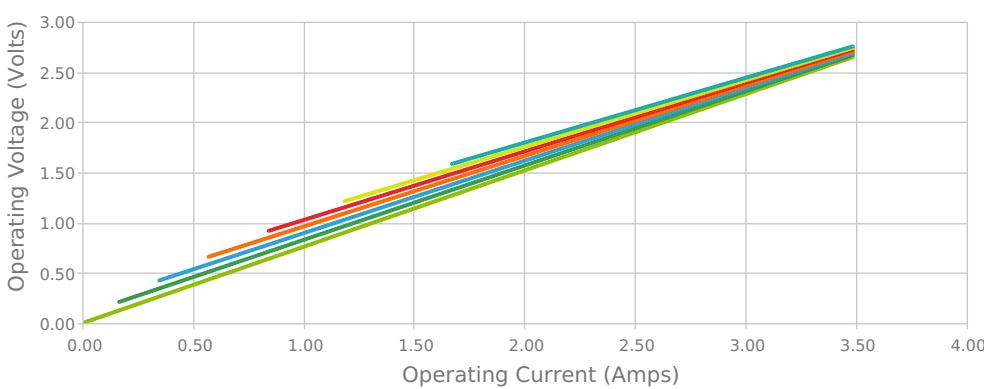
Heat Pumped at Cold Side  
 $T_{\text{hot}} = 27$  °C



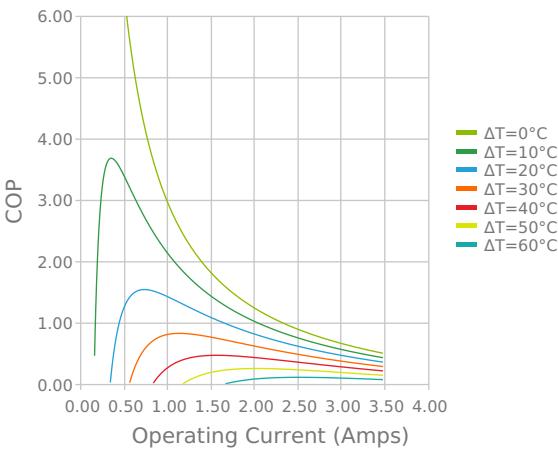
Heat Pumped at Cold Side  
 $T_{\text{hot}} = 27$  °C



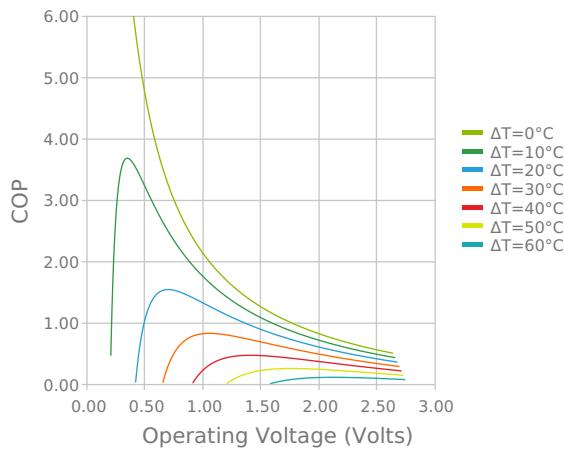
Current vs Voltage (I vs V)  
 $T_{\text{hot}} = 27$  °C



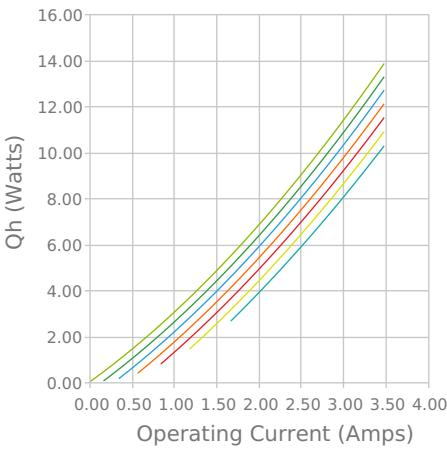
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27^\circ C$



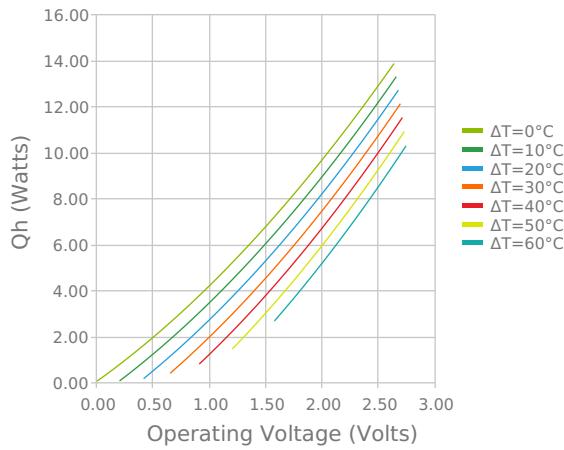
Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 27^\circ C$



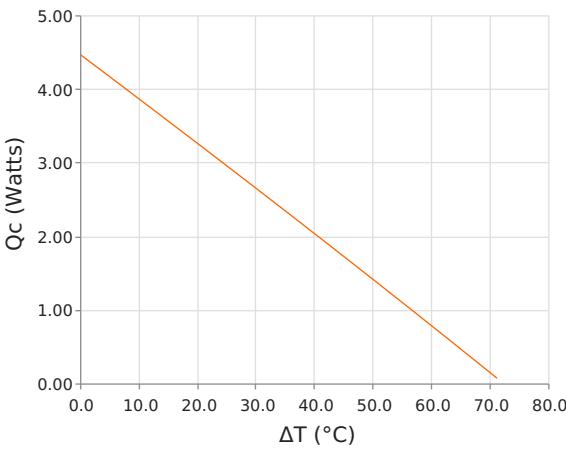
Total Heat Dissipated at Hot Side ( $Q_h = Q_c + P_{in}$ )  
 $T_{hot} = 27^\circ C$



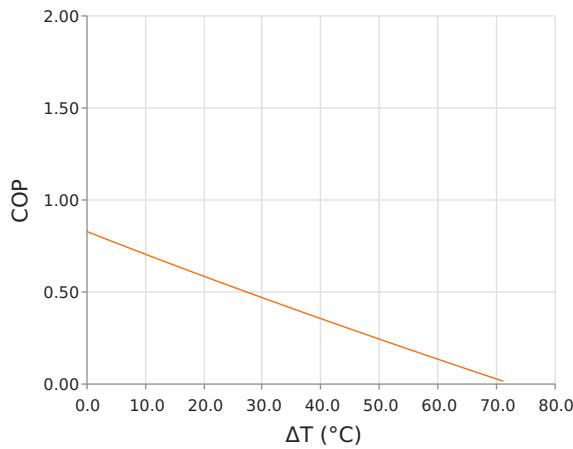
Total Heat Dissipated at Hot Side ( $Q_h = Q_c + P_{in}$ )  
 $T_{hot} = 27^\circ C$



Heat Pumped at Cold Side ( $Q_c$ )  
 $T_{hot} = 35^\circ C$  |  $I_{operating} = 2.6$  Amps



Coefficient of Performance (COP =  $Q_c/P_{in}$ )  
 $T_{hot} = 35^\circ C$  |  $I_{operating} = 2.6$  Amps



## Specifications

Hot Side Temperature	27.0 °C	35.0 °C	50.0 °C
Qcmax ( $\Delta T = 0$ )	4.6 Watts	4.8 Watts	5.0 Watts
$\Delta T_{max}$ ( $Q_c = 0$ )	70.5°C	73.5°C	78.8°C
I <sub>max</sub> (I @ $\Delta T_{max}$ )	3.1 Amps	3.1 Amps	3.0 Amps
V <sub>max</sub> (V @ $\Delta T_{max}$ )	2.5 Volts	2.6 Volts	2.8 Volts
Module Resistance	0.76 Ohms	0.79 Ohms	0.85 Ohms
Max Operating Temperature	80 °C		
Weight	3.0 gram(s)		

## Finishing Options

Suffix	Thickness	Flatness / Parallelism	Hot Face	Cold Face	Lead Length
L1	3.581 ±0.025 mm 0.141 ± 0.0010 in	0.025 mm / 0.025 mm 0.001 in / 0.001 in	Lapped	Lapped	114.3 mm 4.50 in

## Sealing Options

Suffix	Sealant	Color	Temp Range	Description
	None			No sealing specified

## Notes

Max operating temperature: 80°C  
Do not exceed I<sub>max</sub> or V<sub>max</sub> when operating module  
Reference assembly guidelines for recommended installation  
Solder tinning also available on metallized ceramics

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