**Peltier Effect Cooling Units**

**Part Number**

<table>
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<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>P</th>
<th>Unit Price</th>
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<tr>
<td>PELT</td>
<td>128</td>
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**Ordering Example**

PELT40 1-3 pcs.

**Precautions for Use**

- *Do not stop heat radiation fan while using Peltier Effect Cooling Units.* It might cause damage because of the rise of temperature of Peltier element.
- *Ensure the power source polarity to be correct.* Voltage must remain within the rated value. If the voltage is below the standard, the heat dissipation fan might stop. Combination use with MISUMI's Peltier Effect Cooling Units Controller (P1534) is recommended for safety use.
- *Ensure that insertion or extraction load is not applied to the Peltier device.* (Refer to allowable load of above specifications.)
- *Apply insulation to cooling surface to prevent condensation.* Wipe off water droplet when condensation occurs. Continuous use might cause internal corrosion because of the water intrusion into Peltier element.
- *Ensure temperature sensor is inserted 0.4 mm for temperature measurement and fix it with silicon adhesive bond or similar things.

**Selecting Method:**

1. Obtain the surface area $S_{A1}$ of the box to cool.
2. Obtain $S_{A2}$ for a box with internal dimensions $272(W) 	imes 140(D) 	imes 40(H)$.
3. Obtain $S_{A3}$ for a box with internal dimensions $272(W) 	imes 140(D) 	imes 20(H) 	imes 0.035$.
4. Calculate the heat $Q_{A}$ that occurs in a heat insulating material by the following formula.
5. Calculate the total heat amount $U(W)$, (Appropriate safety factor is 0.6~0.8.)
6. Choose the best unit from the heat absorption property of the unit in the graph.

**Terminology**

- Cooling-capability...The amount of heat it can remove (cool) at full capacity. Please choose Unit No. so that the heat amount is at cooling capability or less. (Refer to Selecting Method on the right-hand page.)

**Ex.)**

Choose No.70 whose heat absorption capacity beyond 40W on the $\Delta T$ (Tr-Tc)=10°C line.

**Ex.)**

Choose No.10 on the $\Delta T$ (Tr-Tc)=5°C line.

**Ex.)**

Choose No.30 and at room temperature 25°C, the maximum controllable operation temperature is 25-48= -23°C.

**Ex.)**

To lower current temperature (Tr) =25°C to achieving temperature inside the cooling box (Tc) $T_c = (25(°C) - 5(°C)) x 0.03(W/m·K) x 0.52(m²)$

**Ex.)**

$U(W) = (25(°C) - 15(°C)) x 0.03(W/m·K) x 0.52(m²)$

**Ex.)**

When fan speed is decreased, value of $Q_2$ is reduced.

**Ex.)**

When water tank is empty $Q_3=0(W)$

**Ex.)**

When heat source is in the water tank, define its caloric value as $Q_3(W)$

**Ex.)**

For internal dimensions of water tank 60x60x100 (mm)

**Ex.)**

ExaustHeat

**Ex.)**

Heat Exchanger will be provided at customer’s end.