ORDER THE MODULE YOU NEED!

NEW!

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THERMOELECTRIC COOLING MODULE MOST SUITABLE FOR YOUR NEEDS

- Traditionally, companies propose to customers a choice of modules they produce. But there are few chances to find among them the most suitable for you. Thus, the goods manufactured from such modules cannot be of superior quality.

- The "Altec" company proposes thermoelectric cooling module most suitable for your needs. The goods produced from such modules can be of the most superior quality.

- The "Altec" company uses high-precision computer technologies for designing modules developed by the Institute of Thermoelectricity, National Academy of Science, Ukraine.

- The "Altec" company uses flexible technologies for modules production elaborated by the Institute of Thermoelectricity, National Academy of Science, Ukraine.

- In designing modules the "Altec" company utilizes the latest theory of thermoelectric modules reliability developed in the Institute of Thermoelectricity, National Academy of Science, Ukraine.

- In designing cooling modules the "Altec" company uses the results of extensive reliability tests of modules conducted by the Institute of Thermoelectricity, National Academy of Science, during the recent 25 years.

- On the whole, the "Altec" company is an industrial base for promotion of the latest scientific and technological achievements of the Institute of Thermoelectricity, National Academy of Science, Ukraine. The information about the Institute of Thermoelectricity is presented in web.page of Internet, www.ite.cv.ua.

- Technologies of the Institute of Thermoelectricity were marked by the International Gold Award for technology and quality in 1999.

- The "Altec" company's modules utilize high-quality Al_2O_3 and *AlN* ceramic plates.

- The "Altec" company's modules utilize commutating copper plates with anti-diffusion coatings.

- The "Altec" company's modules use high-quality thermoelectric materials of its own production based on *Bi-Te-Se-Sb* and *Bi-Sb*. The materials have small-angle controlled unit crystal disorientation providing high figure of merit combined with increased mechanical strength.

- According to operating temperature range preset by the customer, the "Altec" company produces custom-made thermoelectric material which provides the best characteristics of modules.

- The "Altec" company's modules utilize efficient multilayer anti-diffusion barriers 20-50 μm thick which provide high reliability and long service life of modules.

- The "Altec" company's modules utilize plastic commutating solders of controlled thickness which provide high resistance to cyclic temperature effects.

- The "Altec" company's modules utilize special configuration of ceramic plates which provides high module resistance to cyclic temperature effects.

- The "Altec" company's modules utilize efficient technologies for leg material joining with anti-diffusion barriers. The engagement strength reaches the leg material strength.

- The "Altec" company's modules utilize highly efficient silicone sealants which have passed multi-year tests under conditions of open space, elevated humidity, etc.

- The "Altec" company's modules utilize inner module special leg connection schemes which make it possible to increase modules reliability 80 to 2000 times. Such modules are the most efficient in devices with a large number of modules.

- To meet customers' needs, the Altec's modules may be protected from corrosive medium and hermetically sealed within capsules made of sheet stainless steel. The capsules are filled with inert gas of low thermal conductivity.

- To meet customers' needs, the Altec's modules can be produced in accordance with technology which ensures their work in vacuum in hermetic capsules. The capsules can have vacuum-tight input windows, transparent to the necessary section of radiation spectrum, as well as interferential filters with the required spectral properties. The capsules may be provided with vacuum electric leads for their connection to external circuits including multi-element photodetectors or other detectors.

- The "Altec" company designs and produces both single-stage and multi-stage thermoelectric modules.

- To buy modules most suitable for your demands, please inform the "Altec" company about the module parameters you wish to have.
- In the list of parameters, please, indicate:
  - geometric dimensions of modules: a, b, c, mm, (see Fig.1);
  - max. operating voltage U_{max}, V;
  - max. operating current I_{max}, A;
  - operating temperature range, K;
  - max. cooling capacity Q_{max}, W at the given equal temperatures $T = T_C - T_h$, K at the ceramic plate surfaces (Fig.1);
  - max, temperature difference ΔT_{max}, K where $\Delta T_{max} = T_C - T_h$ at given temperature T_h, max.operating voltage and current;
  - *l* - length of input leads, mm;
  - l_0 - length of a lead section without insulation, mm.
- In addition to general module parameters, the following parameters and information would be welcome
  - admissible deviations from geometric dimensions of a module: $(a \pm \Delta a)$,mm; $(b \pm \Delta b)$, mm; $(c \pm \Delta c)$, mm;
  - admissible deviation from leads length $(l \pm \Delta l)$, mm;
  - admissible deviation from max.current $(I_{max} \pm \Delta I_{max})$,A;
  - admissible deviation from max.voltage $(U_{max} \pm \Delta U_{max})$,V;
  - admissible deviation from the max.cooling capacity value $(Q_{max} \pm \Delta Q_{max})$,W;
  - admissible deviation from maximal temperature difference $(\Delta T_{max} \pm \Delta_{\Delta Tmax})$ K;
  - state of outer surfaces of ceramic plates:
    - free;
    - metallization of plate surfaces with nickel, gold or other metals;
    - metallization coating with solder alloys, which precisely;
- the necessity of modules sealing:
  - by silicone sealants;
  - by metal thin-walled case;

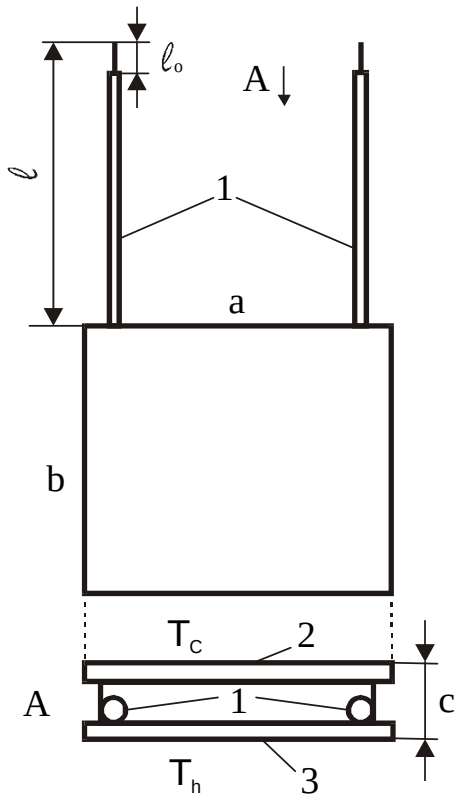

Fig.1. Diagram of a thermoelectric module

1 - electric leads; 2 - cold ceramics; 3 - hot ceramics;
T_C - temperature of ceramic plate outside surface without leads *l*;
T_h - temperature of ceramic plate outside surface with leads *l*.

• data on required reliability of modules:

•• admissible deviation of basic parameters of modules under:

- preservation during 10 years (or other period);
- operating time in hours - 100 000 (or other number of hours);
- On-Off cycles - 10 000 (or other) at temperature difference $\Delta T = 1/2\Delta T_{max}$ (or other ΔT);
- cycles of 5 000 (or other) formed by the current I direction change at given T_h and $T_C^{(-)}$ under cooling condition and $T_C^{(+)}$ under heating condition;

•• other data on reliability according to customer's wish (effect of impacts, vibration, humidity, etc;

•• admissible number of module failures M - 5 (or other number) of 1000 modules (or other number) for concrete type of tests or a combination of tests;

•• admissible error of 20% (or other number) in the determination of the number of failures M;

•• data on the number of modules which are used in one product for designing the innner module leg connection schemes in order to increase product reliability.

• The "Altec" company can design the most suitable for a customer module according to the given module parameters. The period of design is not more that 48 hours.

• The "Altec" company utilizes flexible technology to prepare production of the module most suitable for a customer. The term of production preparation is from 3 to 30 days depending on the customer's order.

• If a customer orders more than 1000 Altec's modules,the cost of design and production preparation will be met by the "Altec" company and does not affect the price of the module.

• The flexible and up-to-date technologies used by the "Altec" company make it possible to develop modules most suitable for every customer at the prices lower than standard similar modules and of higher quality compared to standard modules.

Orders for modules and additional information:

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Additional information can be found on the page in Internet

http://ite.cv.ukrtel.net/altec

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