

Installation of module

A thermoelectric cooler contains comparatively fragile semiconductor material and therefore demands strict execution sequence of certain operations while assembling. Neglect of any of the operations leads to the cooler efficiency decreasing or even failure.

Within a final product-device thermoelectric module should never be used as a supporting element. The mounting surfaces of TE module to be installed should have unflatness and nonparallel values not more than 0,020 mm and, of course, kept clear of dirt or other grease residuals. In case if two or more TE modules are implemented in the customer device height tolerance of the latter (modules) should not exceed 0,050 mm.

How to install thermoelectric module?

Widely used method of TE module assembling is to allocate the module between a heat sink and a cold plate to be clamped. Visual explanation details of this procedure are shown on Fig. 1 and 2.

To install a thermoelectric cooler the operator should proceed with the following operations:

1. Put a layer of thermal grease as thin as possible onto the seat-place of the heat sink. Place a thermoelectric cooler in the suitable position and gently applying pressure with fingers move the cooler back and forth to squeeze out the excess of thermal grease.

IMPORTANT: before installation it is necessary to ensure cleanness of all contact surfaces.

2. Put a layer of thermal grease on the appropriate place of cold plate and locate the plate onto the TE cooler. Squeeze out the excess of thermal grease as described in step 1.

3. Regardless of clamping screws quantity, clamping force should be approximately 13-15 kg per square centimeter. Under such conditions thermal resistance of grease is minimized. Reaching the required value of torque (see calculation in "E.g. remarks") leave the assembly for an hour. Check the torque and retighten if necessary.

Additional information. Using recommended clamping force thermal resistance of grease with thickness about 0.03 mm will be in range of 0.03-0.05 °C/W for a coverage area of 40 by 40 mm taking into account the type of grease applied.

E.g. remarks: QC-127-1.4-6.0M (see "General Specification") should be clamped under 210-240 kg force. If you install a thermoelectric element with the usage of

modern thermal greases you should know that temperature losses at hot side can approach the value of 2.7°C.

If two 4 mm in diameter clamping screws are used the torque per screw should be 0.11-0.12 kg x m.

If you use four clamping screws the torque per screw should be 0.05-0.06 kg x m.

If you know the desired clamping efforts for your TE module you can calculate a torque per screw as given in the formula below:

$$T (\text{torque per screw}) = (2.8 \times 10^{-4} \times p \times d)/n,$$

where

p - desirable clamping force (kg);

d - diameter of screw (mm)

n - quantity (2-4) of clamping screws.

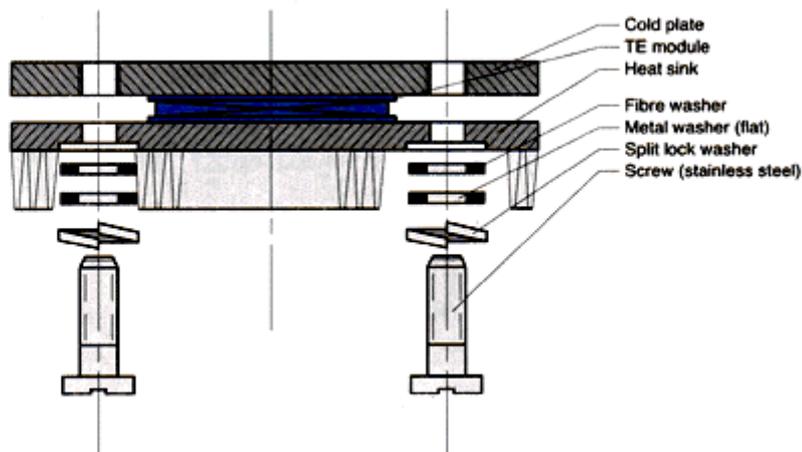


Fig. 1

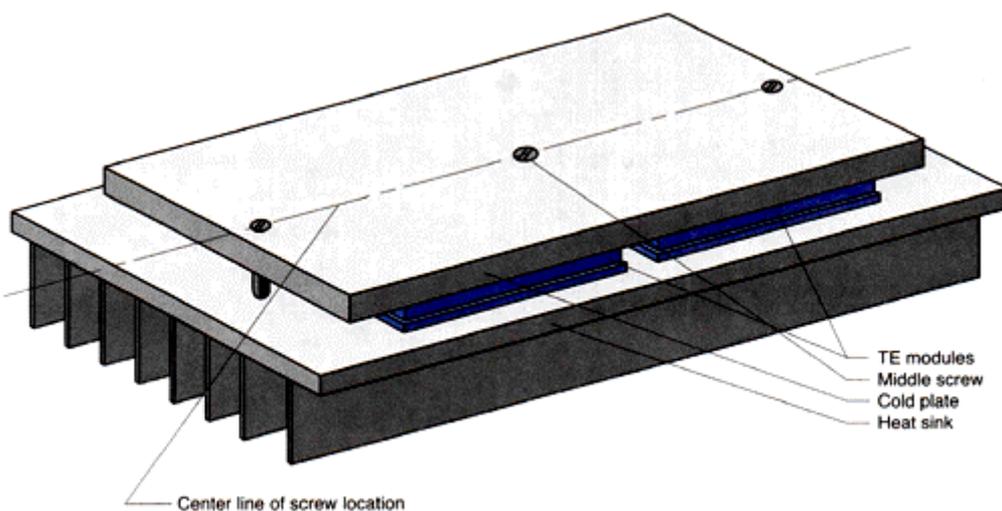


Fig. 2