



Liquid Cooled Plate for Railway IGBT Converters



DESCRIPTION

The IGBT Converter cooler is a cost effective design aimed for the high demands of the railway industry.

It is designed to have 8 IGBT units mounted on both sides of the plate.

The cooler is made up by two thin steel sheets, each with a thickness of 0,4 mm, of high alloy stainless steel. The thin steel sheet is cold rolled with a very low surface roughness. There is therefore no need for costly machining of the surface. A low heat resistance between the components base plate and heat transfer surface is achieved by the low surface roughness of the cold rolled steel sheet.

The unique design of the cold plate gives a flexible heat transfer surface that adapts to the base plate of the components. The internal pressure of the liquid will force the surface of the cooler towards to the base plate of the IGBT.

The use of stainless steel gives a tough design that withstands rough environments and admits the use of optional cooling media.

Other benefits with stainless steel are that much higher fluid velocities can be approved compared with cold plates in aluminium or copper.

The fluid dynamics in the channel where the heat transfer takes place is pure laminar. The meso-sized channels has an equivalent diameter of 0,8 mm. The flow path starts at the inlet channel in the middle that feeds the meso-channels, between the IGBT's base plates, with a parallel flow and further to the outlet channel in the peripheries.

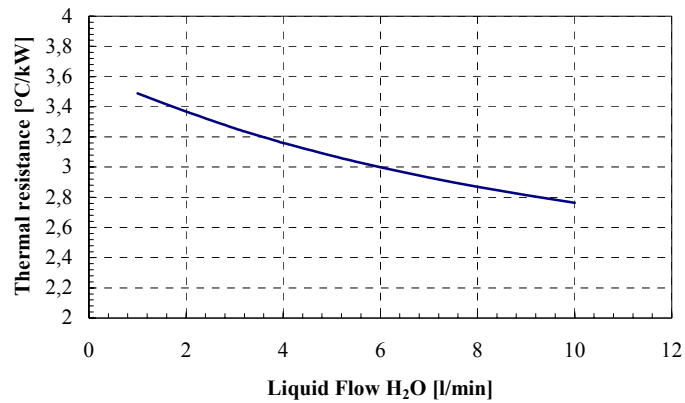


Figure 1. LCP with flexible heat transfer surface.

The concept for the Railway IGBT cooler is taken from the cooler CP4U Flex, see figure 1. This cooler has a patented design and manufacturing technology.

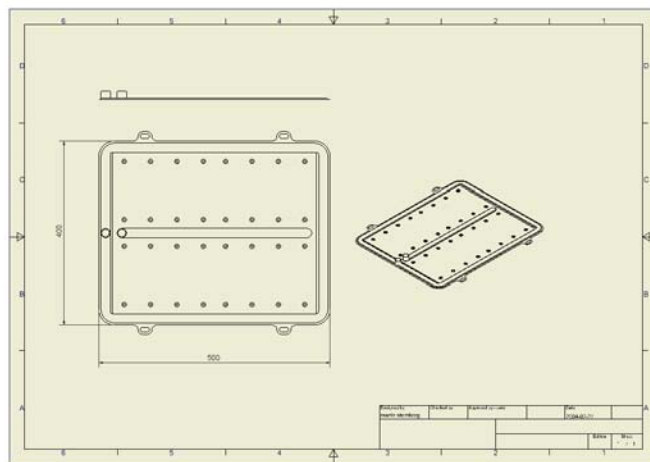
TECHNICAL INFORMATION

Thermal resistance for one IGBT unit
Surface area 0,028 m²



Thermal resistance R_{SL} -Heat sink to liquid.

Note: The thermal resistance is calculated by means of the logarithmic temperature difference.



IGBT CONVERTER COLD PLATE

Width x Length x Height: 500x400x8 mm

Weight: 1,6 kg

Material: EN 1.4547 /ASTM S31254

Pressure drop < 65 kPa @ 40 l/min

Benefits

- Flexible heat transfer surface
- Extremely low weight
- High alloy stainless steel
- Thin and compact design
- Low thermal resistance
- Withstands all cooling media

For more information please contact:

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