




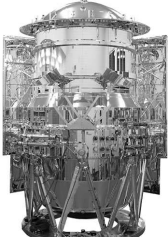
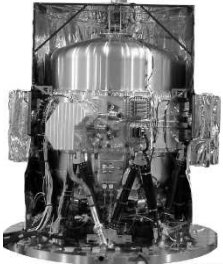
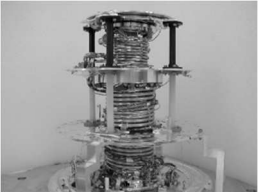
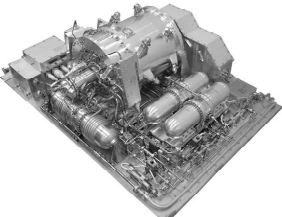



# Mechanical Coolers for Space Use

The line-up covers from 1K to 200K

Cooler and Temperature	Heritage	
<p><i>For 50 – 200K</i></p>  <p><b>Single-stage Stirling Cooler</b>            Cooling Power : 2 W at 80 K            Input Power : &lt; 50 W            Lifetime : &gt; 5 years            Mass : &lt; 5 kg</p>	 <p><b>AKATSUKI</b> (<u>Venus Climate Orbiter</u>) / <b>IR2</b>            Launched in 2010</p>	  <p><b>KAGUYA</b> (<u>Selenological and Engineering Explorer</u>) / <b>GRD</b>            Launched in 2007</p> <p><b>SUZAKU</b> (<u>X-ray Astronomy Satellite</u>) / <b>XRS</b>            Launched in 2005</p>
<p><i>For 20 – 50K</i></p>  <p><b>Double-stage Stirling Cooler</b>            Cooling Power : 0.2 W at 20 K                              1 W at 100 K            Input Power : &lt; 90 W            Lifetime : &gt; 5 years            Mass : &lt; 9.5 kg</p>	 <p><b>AKARI</b> (<u>Infrared Imaging Satellite</u>)            Launched in 2006</p>	 <p><b>HITOMI</b> (<u>X-ray Astronomy Satellite</u>) / <b>SXS</b>            Launched in 2016</p>
<p><i>For 4K</i></p>  <p><b>4He Joule-Thomson Cooler</b>            Cooling Power : 30 mW at 4.5 K            Input Power : &lt; 180 W            Lifetime : &gt; 5 years            Mass : &lt; 28 kg</p>	 <p><b>ISS / KIBO / SMILES</b> (<u>Superconducting Submillimeter-Wave Limb-Emission Sounder</u>)            Launched in 2009</p>	
<p><i>For 1K</i></p>  <p><b>3He Joule-Thomson Cooler</b>            Cooling Power : 10 mW at 1.7 K            Input Power : &lt; 170 W            Lifetime : &gt; 5 years            Mass : &lt; 39 kg</p>	<p>Life testing is ongoing.</p> <div data-bbox="842 1682 1372 1901" style="border: 1px solid black; padding: 5px;"> <p><b>INDUSTRIAL EQUIPMENT DIVISION</b>  <b>Tokyo Head Office</b>            ThinkPark Tower, 1-1, Osaki 2-chome, Shinagawa-ku,            Tokyo 141-6025, Japan            TEL:+81-3-6737-2565 FAX:+81-3-6866-5114</p> <p><b>Niihama Works</b>            5-2, Sobirakicho, Niihama, Ehime 792-8588, Japan            TEL: +81-897-32-1443 FAX: +81-897-32-6554</p> </div>	

 **Sumitomo Heavy Industries, Ltd.**

<http://www.shi.co.jp/quantum/index.html>