

# Rheion<sup>®</sup> Thermal Switch 40

## Precise thermal control for smaller space applications

Designed for smaller spacecraft with lower thermal loads and missions with an operational life of up to 7 years, the Rheion<sup>®</sup> Thermal Switch TS-40 enables precise, active control of thermal conductance between two surfaces. By decoupling radiators exposed to sunlight while coupling those in shadow to maximise heat rejection, the switch makes it possible to add more radiator surface area, increasing the thermal budget for payload power and supporting higher data throughput. The Rheion<sup>®</sup> Thermal Switch uses non-conductive, fire-proof, dielectric fluid, has no moving parts and operates silently and without vibration, thereby eliminating mechanical wear.

## Benefits

### Increased payload capacity

Enables up to 20% more thermally supportable payload power through selective coupling of available radiator surfaces.

### No power in OFF mode

Power consumption in OFF mode is 0 W. ON/OFF control from standard bus voltage, 28V.

### No moving parts

No moving parts mean no vibrations and therefore no mechanical wear.

### Ground-testable

Limited influence from gravity enables validation testing on the ground before flight.

### Lightweight design

At less than 800 g, the TS-40 is suited for the mass constraints of small satellites.

### Fast response in all conditions

Quick start and stop time at any operating temperature.

### Developed with leading space agencies

Duty-cycle operation allows fine-tuned regulation of thermal conductance, keeping sensitive components within their optimal temperature range regardless of external conditions.



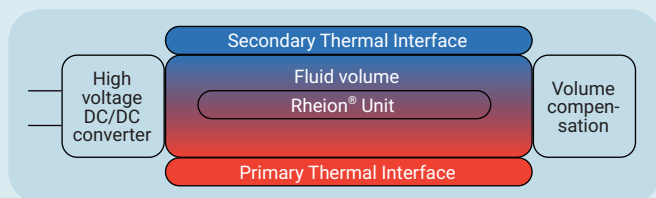
## Applications

The TS-40 is designed for small satellites in large constellations, such as broadband and Earth observation missions in low Earth orbit, where it can be used to increase payload capacity and support additional subscriber capacity. It also provides precise temperature control of sensors and other thermally sensitive equipment.

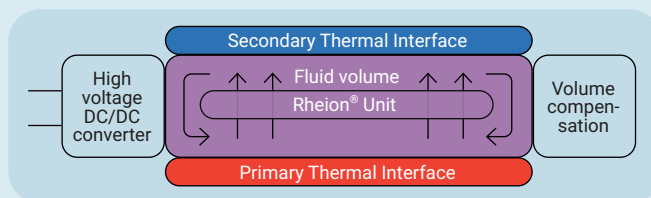
## Technical Data

|                                           |            |
|-------------------------------------------|------------|
| Heat transport (W)                        | 40         |
| On-conductance (W/K)                      | 0.9        |
| Off-conductance at RT (W/K)               | 0.2        |
| Power consumption in ON (W)               | 0.5        |
| Thermal interface area (cm <sup>2</sup> ) | 33         |
| Operating temperature (°C)                | -50 to +85 |
| Weight (g)                                | <800       |

OFF-state: No power applied, stationary fluid and low thermal conductivity



ON-state: Power applied, moving fluid and high thermal conductivity



## About APR

APR Technologies is a Swedish deep tech company, developing and producing high-performance liquid cooling solutions for applications in chip cooling, batteries, space and defence. The technology directs cooling liquid flow directly to the heat source using no moving parts and is protected by more than 70 granted patents in 22 countries. APR Technologies is headquartered in Enköping, Sweden.