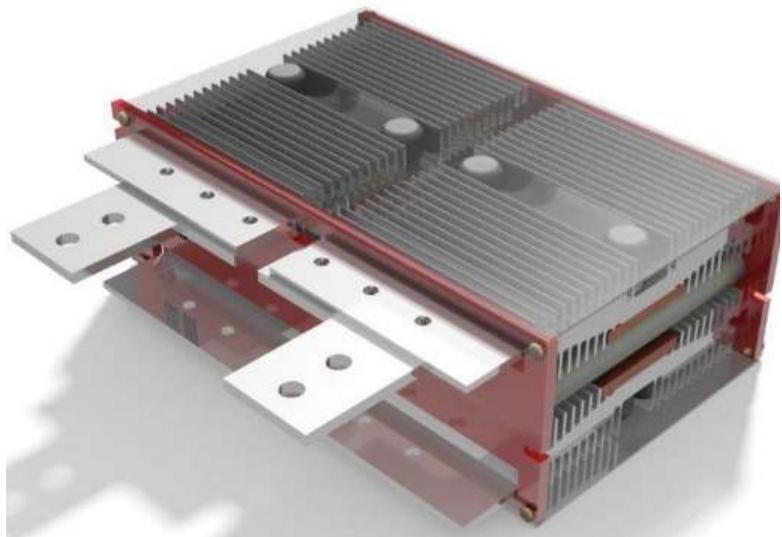




Static Transfer Switches & Rectifiers for UPS applications.

500A to 3000A Static Transfer Switches

For many years, PSL has supplied a bespoke range of customer-specific STS units from 500A to 3000A using conventional aluminium-extrusion heat sinks. In some cases, unique extrusion dies have been necessary to achieve optimal cooling of these switch designs, however aluminium-extrusion heat sinks are still the most cost-effective method of cooling this range of STS. Indeed, many of the STS units that we produce are constantly under design-review by our customers, and therefore using heat sinks made from extruded profiles allows for best-possible product availability and overall best value-to-cost ratio.



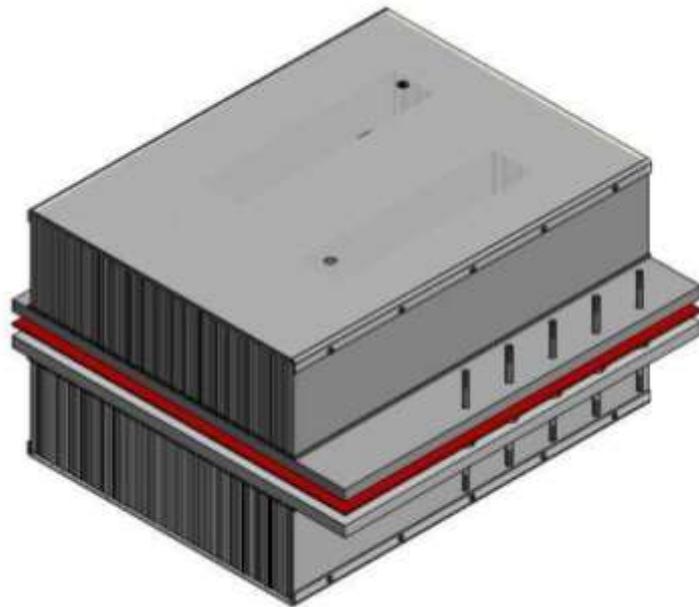
4000A Static Transfer Switch

In recent years, higher current demands have created a requirement for Static Transfer Switches to operate at 4000A or more.

Thyristors dissipating many thousands of watts need to be forced-air cooled over heat sinks which comprise a high-density fin structure – however bonded fin heat sinks do not have the rigidity of standard extrusion heat sinks, therefore clamping the thyristors in a conventional manner could have presented a potential problem.

PSL are the UK's oldest & most experienced manufacturer of Bonded-Fin heat sinks, and, together with high-powered fans and our own bespoke low-profile method of clamping the thyristors, we are able to manufacture any custom design of 4000A Static Transfer Switch using this cooling solution.

Over the last 8 years we have manufactured and distributed several hundred 4000A STS units, worldwide.



5000A Static Transfer Switch

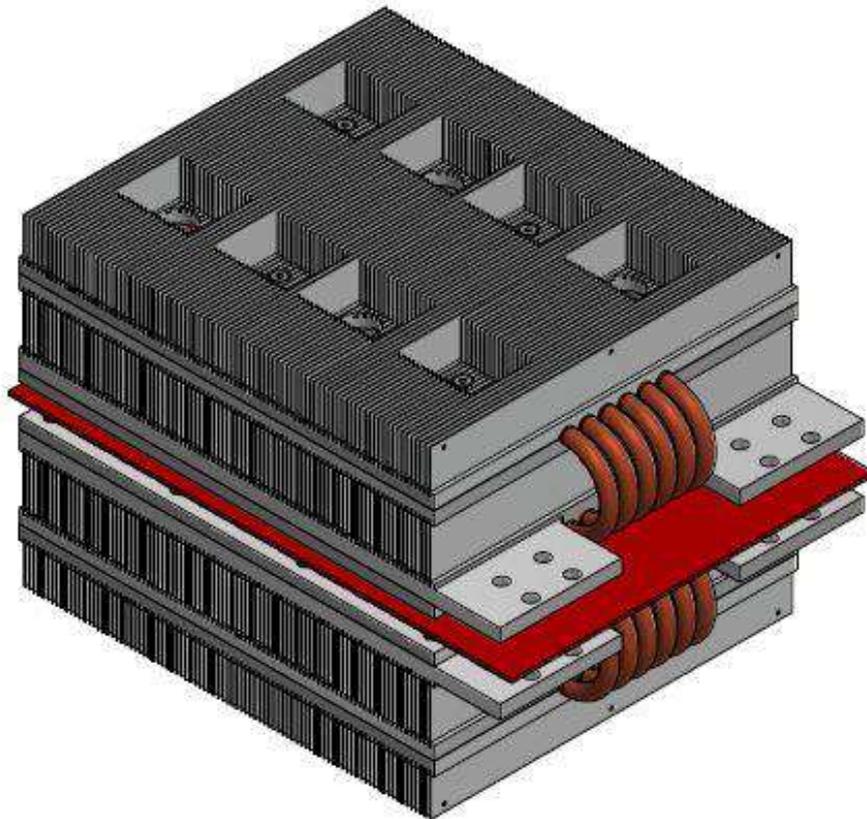
Our success with manufacturing 4000A Static Transfer Switches, led us to receive a number of enquiries for 5000A STS units.

However, the accepted cooling method used in the 4000A STS units was not able to accommodate the increased losses associated with 5000A, and therefore a new solution was needed.

Our experience in the traction industry enabled us to incorporate heat pipes into our existing bonded-fin heat sink designs, but with due consideration for evaporation & condensing zones.

Using a boxed profile, we were then able to allow the heat pipes to be in close contact with the Thyristor pole area, whilst maintaining optimum distance between the heat pipe and the condensing zone.

Additional challenges included maintaining the Thyristor junction temperature at below 125°C. Without heat pipes, this temperature would have been 150°C – however by creating an evaporating circuit as large as possible, and by maximising the surface area in the condensing zone, we were able to maintain a junction temperature of 114°C.



6000A Static Transfer Switch

Further developments in the clamping arrangement and the location of the heat pipes, enabled us to further improve the design to ultimately achieve a 6000A Static Transfer Switch.

With switch requirements higher than 5000A, this newest design accommodates the additional device loss by maintaining the concentrated heat pipe arrangement in the evaporation zone, but now spreading the heat pipes across the whole top section of the bonded-fin heat sink to maximise the condensing zone.

The condensing zone benefits from a modified fin structure – thereby, massively increasing the surface area of fins available for cooling the heat pipe.

