

EnergiVault® TSR1™ - 1MWh Thermal Battery

The EnergiVault TSR1 thermal battery is a modular cold thermal energy storage system designed for enhanced resilience applications such as data centres. The enhancements include N+1 discharge pumping, such that the battery can ensure ultra-high reliability discharge. In addition, the battery is equipped with an enhanced interface heat exchanger capable of high short term discharge duties possible with the high flow and return temperatures typical in data centre air handlers.

It complements new and existing chiller installations enabling flexible, low energy cost, low carbon chiller installations with added resilience.

Energivault is a highly scalable cold energy storage thermal system with its batteries and charger configurable for low and medium charge rates and high storage levels and cooling rates.

The Energivault thermal battery provides ultra quick cooling response to high discharge rates of cooling. The Energivault has been designed, built and tested in the UK by Organic heat Exchangers.

EnergiVault Thermal Battery, EVS-1000 Specification

Stored Thermal Energy (latent)	1,000 kWh _t
Nominal Cooling Capacity	200 kW _t
Short term cooling capacity	Immediate 1,000 kW up to 5 minutes
Cooling Duration	A function of cooling demand and operational fluid temperatures
Response time from export signal to export	< 5 seconds
Internal battery temperature	-7°C to -3°C
Compatible chiller circuit temperature	+5°C to +25°C
Volume of energy storage fluid	c.20,000L
Energy storage fluid	Water with 10% propylene glycol
Maximum operating pressure	< 0.5 bar g (static head pressure of battery volume)
Standby losses	< 1%
Round trip efficiency	> 95%
Lifetime cycles	No Limit
Noise – Pressure Level (dB(A) @ 10m	60
Lifetime degradation	None
Lifetime	20 + years
Dimensions (L x W X H)	Contained: External Dims: 6.1m x 2.44m x 2.6m
Electrical Input Power	Up to 4kW when discharging. Taken from Charger.
User Interface	Touch screen with operator and service dashboards
Approximate Operating Weight	26,000 kg
Compliance, Safety	European Pressure Equipment Directive; 2014/68/EU. Article 4, para 3 – Sound Engineering Practice When shipped empty, complies with Container Safety Convention, CSC.

Enhanced Interface HX: <u>Customer side</u>	To confirmed with client
Type/ Material	Plate and frame HX, 316 Alloy
Flow and return temperatures	18°C flow; 24°C return (lower return possible for header blending)
Flow rate	Up to 40L/s for 1000kW
Connections	Standard DN50 flanged to interface HX (options for agreed peak cooling duty)
Pressure drop	TBD based on customer configuration

EnergiVault Communications Gateway

Supported electrical/ heat/ cooling meters	Modbus RTU, Modbus TCP; 24VDC Supply available
Supported BMS Protocols	Modbus RTU (over RS485), Modbus TCP (over ethernet)
Supported Internet Access	Integrated 4G/5G, LAN connection over ethernet
User Interface and software functionality	Local touch screen with mimics and schedules; Cloud platform with mimics, schedules, analytics, dashboards, reports and AI optimiser