



Each **Storage Boiler** system is comprised of four sub-system packages:

1. **Heat Cell** – Blocks of Caldera's patented thermal storage material are enclosed in a vacuum-insulated cover and heated directly by electricity from the grid or on-site renewables. Each Heat Cell stores 5 MWh; storage is increased by adding further Heat Cells. Stored heat is converted to steam by injecting water into pipes embedded in the storage material, which can then be piped directly into the site's steam network.
2. **Ultra-Pure Water Treatment** – Takes RO water or condensate and runs further processes that include a second stage of RO, CO₂ removal, EDI and de-oxygenation. The water treatment package does not need to be co-located with the Heat Cell and is often better situated near existing water treatment equipment.
3. **Power & Control Module** – A factory-assembled package containing switches and thyristor controls that allows variable charging from 0-100%. The power supply is designed to provide 2 MW at 690 V or 650 kW at 400 V. This package includes an energy management system, dynamically responding to charging signals and heat demand.
4. **Transformer** – If required, Caldera includes a transformer that provides the Power & Control Module with a 690 V or 400 V supply from the site's MV power grid.

The system is **modular** and **scalable**. The example overleaf is for two Heat Cells, two Power & Control Modules, and one transformer.

Example specification	Model SBX-4.0-10-2.6
Nominal storage capacity*	10 MWh (2 Heat Cells)
Maximum charge rate	4.0 MW _e (at 690 V)
Charge response (switching time)	< 1 s
Charging efficiency (full load)	97%
Maximum discharge rate (continuous)	4 t/h (2.6 MW _{th}) Higher rates on request
Minimum discharge rate	0.2 t/h
F&A 100°C (From and at 100°C)	4.4 t/h
Round trip efficiency (typical daily cycling)	94%
Heat loss rate (in standby)	3.6% / 24 h
Depth of discharge	0-100%
Design lifetime	> 20 years
Primary (site network) rated voltage	11 kV / 20 kV / 33 kV
Secondary (Caldera) rated voltage	690 V / 400 V
Maximum operating pressure	16 barg
Steam dryness	> 95%
Feedwater temperature range	20 – 120°C
System sizing	
Power & Control Module	4.4m x 2.2m x 0.84m
Ultra-Pure Water Treatment	8.0 m x 3.5 m Subject to site requirements
Heat Cell diameter	3.0 m
Heat Cell height	12.5 m
Single Heat Cell mass	110 t

* Nominal storage capacity and maximum discharge rate assumes 6 bar delivery pressure and 80°C feedwater temperature.

Heat Cells are designed, manufactured and tested in accordance with Pressure Equipment Directive 2014/68/EU, and the requirements of harmonised ISO standards.

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