



Each **Storage Boiler** system comprises 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 using electricity from the grid or on-site renewables. Each Heat Cell stores 5.2 MWh; the system is fully modular so that storage can be increased by adding more Heat Cells. Stored heat is converted to steam by feeding water through coils embedded in the storage material. The steam then flows directly into the site's steam network.
2. **Water Treatment Package** – Treats feedwater and returned condensate and includes a second stage of RO (Reverse Osmosis) and de-aeration. This package does not need to be co-located with the Heat Cell and is often better situated near existing water treatment plant.
3. **Power & Control Module** – A factory-assembled power and control package comprising switchgear and thyristor controls, modulating the charging load continuously from 0 to 100%. An integrated energy management system schedules charging dynamically against heat demand, tariffs and external dispatch signals.
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 medium voltage 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*	10.4 MWh (2 Heat Cells)
Maximum charge rate	4 MW _e (at 690 V) 1.3 MW _e (at 400V)
Charge response (switching time)	< 1 s
Maximum dispatch rate (continuous)	4 t/h (2.6 MW _{th}) @ 0-100% SOC
Maximum dispatch rate (peaking)	12 t/h (7.8 MW _{th}) @ >75% SOC
Minimum dispatch rate	0.4 t/h
Power to heat efficiency	97%
Heat loss	8 kW 3.6% / 24 h (@ 100% SOC)
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 or 400 V
Maximum delivery pressure	16 barg
Steam dryness	Ultra-dry with 5°C of superheat
Feedwater temperature range	20-105°C
System sizing	
Power & Control Module	3.6 m x 2.2 m x 0.8 m
Water Treatment Package	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	120 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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