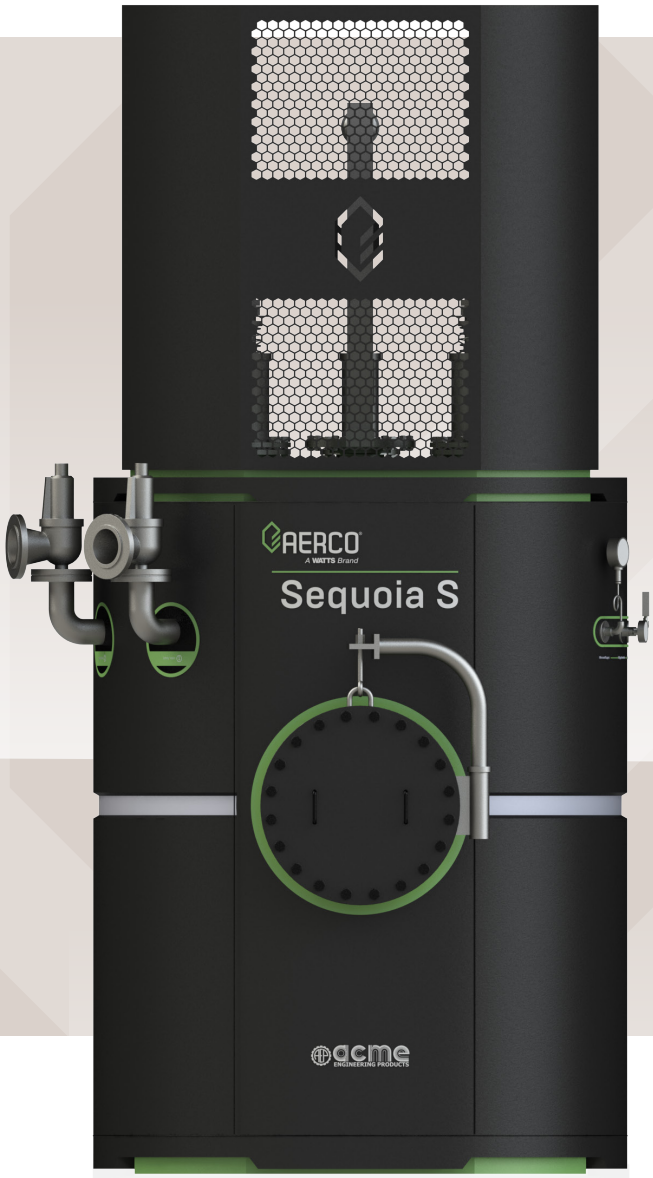
Sequoia® S

Electric High Voltage Immersed Electrode Steam Boilers



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AERCO®
A WATTS Brand

High-Performance, Zero-Emission Steam Generation

Sequoia S is an immersed electrode steam boiler from AERCO that delivers dependable, high-capacity steam with minimal maintenance and zero onsite emissions. Designed for large commercial and industrial facilities seeking to electrify their heating systems, Sequoia S is a clean, efficient alternative to traditional fossil fuel boilers.

Available in capacities from 2 MW to 70 MW, this fully electric unit operates directly at distribution voltages, eliminating the need for fuel storage, burners, or flue systems. A rugged, compact pressure vessel houses water-cooled electrodes that deliver rapid steam generation, reaching full output in as little as 30–40 minutes from a cold start or 1 minute from a hot start.

Ideal for facilities with steady steam loads, Sequoia S combines high efficiency, a 10:1 turndown ratio, and simplified installation for a seamless path toward sustainability and lower operational costs.

Zero onsite emissions

10:1

10:1 turndown ratio

Fast steam availability

99.5% efficiency

Safe, flame-free operation

Quiet, clean performance

Minimal maintenance

Installs at distribution voltage

Built for Efficiency, Safety, and a Cleaner Future

Advances ESG and Decarbonization Goals

The Sequoia S boiler helps organizations meet aggressive decarbonization targets by eliminating on-site combustion and Scope 1 emissions. With no fuel storage, no stack, and no local pollutants, it is a clear choice for facilities transitioning to electric heating solutions that align with long-term ESG strategies and carbon reduction commitments.

Reduces Operating Costs Over Time

This electrode boilers convert up to 99.5% of electricity into steam, maximizing energy efficiency and minimizing waste. Automated controls reduce labor demands, and smart turndown capabilities help match output to real-time demand, minimizing unnecessary energy use. Facilities can further lower costs by operating during off-peak electricity hours.

Simplifies Installation

Sequoia S runs directly at distribution voltages, removing the need for fuel delivery infrastructure, stacks, economizers, or emission control systems. That means faster installations, lower capital costs, and less engineering complexity compared to traditional boiler systems.

Safe and Easy to Operate

With no flame, no fuel, and no combustion-related hazards, Sequoia S is inherently safer than conventional boilers. Electrode technology prevents operation without water, while the grounded pressure vessel adds an additional layer of electrical safety. All operations are controlled via an intuitive HMI and PLC system for user-friendly control and diagnostics.

Straightforward Maintenance, Reliable Operation

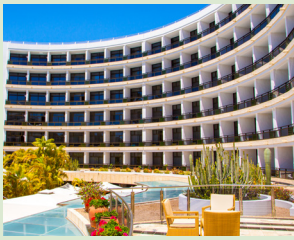
With minimal moving parts, no burners, and no fuel lines, maintenance is simplified. Long-life electrodes are continuously cooled by internal water circulation, extending service intervals. The result? Fewer unexpected shutdowns, greater uptime, and lower total cost of ownership.

Many Applications

Ideal for applications with high steam demand – whether for hot process water, sanitation, or large-scale space heating.

Healthcare Facilities: Hospitals, clinics, and medical centers needing reliable, sterilization-grade steam.

Hospitality: Hotels, resorts, and conference centers seeking clean, quiet, and compact steam solutions.



Universities & Schools: Campus-wide steam heating and lab sterilization without fossil fuel infrastructure.

Manufacturing & Processing: Heavy-duty steam demand for industrial operations, textiles, and clean process environments.

Food & Beverage: Safe, flame-free steam ideal for cooking, sanitation, and packaging in food production.

Engineered for Performance, Reliability and Flexibility

Key Features

- Immersed electrode hot water boilers
- Available in 10 sizes from 2 MW to 70 MW
- Output: 100 to 300 psi steam (custom options available)
- Operates at 4.16 to 25 kV, 4-wire system)
- Up to 99.5% electrical-to-steam efficiency
- Immersed electrode design with grounded pressure vessel
- Full load from cold start in 30–40 minutes; hot start <1 minute
- Up to 10:1 turndown ratio with electronic modulation
- Integrated recirculation pump for electrode cooling
- Factory-assembled, pre-wired, and pressure-tested
- Minimal maintenance—no burners or combustion components
- Compatible with low-conductivity water for clean steam
- Optional PLC/HMI with touchscreen, remote monitoring, and diagnostics

Integrated Controls for Smart Operation

Each Sequoia S boiler comes equipped with a standalone, factory-programmed PLC control panel featuring a touchscreen HMI. The system provides full capacity tracking, safety interlocks, water level control, remote monitoring options, and data reporting to give operators complete visibility and peace of mind.

How it Works

The Sequoia S boiler uses the conductive and resistive properties of water to generate steam. An AC electrical current flows from the electrode through the water to a grounded counter-electrode, heating the water directly. The integrated recirculation pump maintains a constant cooling flow around the electrodes to ensure stable, safe performance and extend electrode life. Steam output is modulated by an electronically driven barrier shield that adjusts the exposed surface area of the electrode, enabling a high turndown ratio of up to 10:1.

The entire process is highly efficient, converting nearly all input electricity into usable thermal energy, with no combustion, no emissions, and minimal mechanical complexity.

System Built for Safety, Simplicity, and Speed

- **Safety First** — Pressure-rated vessel, grounded cage, and ASME-certified safety valves
- **Smart Modulation** — Motor-driven shield delivers smooth turndown and demand tracking
- **Service Friendly** — Manhole access, isolating valves, and intuitive instrumentation
- **High Performance** — Optimized flow paths and electrical integration for near-instant response

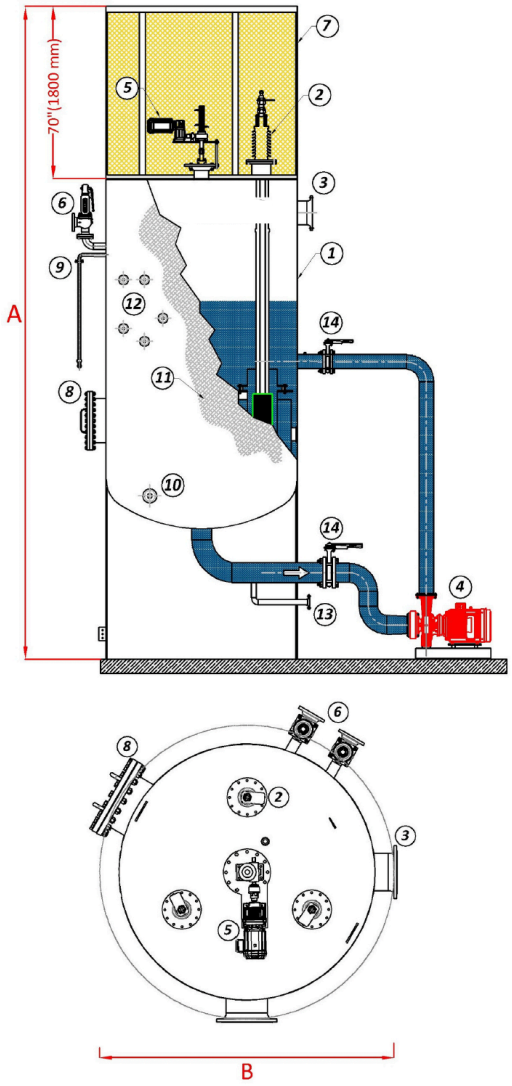
A Closer Look at Sequoia S

Sequoia S features a heavy-duty, ASME-rated pressure vessel **(1)** that ensures reliable long-term containment of high-pressure steam while maintaining safety standards. Electrical power feeds **(2)** are designed for high-voltage inputs ranging from 4.16 to 25 kV within three-phase distribution systems, enabling efficient and stable power delivery. Dry, high-pressure steam is supplied to process or heating applications via the steam outlet **(3)**, supporting diverse operational needs.

Continuous water flow around the electrodes is maintained by the recirculation pump **(4)**, which is critical for effective cooling and consistent conductivity throughout the system. The motorized drive system, also known as the shield actuator **(5)**, precisely adjusts the position of the modulating shield to control steam output and provide flexible turndown capabilities. Safety features include a pressure safety valve **(6)** that offers mechanical overpressure protection in full compliance with ASME Section I, alongside a safety cage **(7)** — an electrically grounded enclosure that protects operators from live electrical components.

For ease of maintenance and inspection, the boiler is equipped with a manhole **(8)** providing internal access, while the instrument manifold **(9)** houses key pressure sensors, level gauges, and safety monitoring instruments essential for system control. The feed water connection **(10)** regulates the inlet of feedwater, maintaining proper boiler water levels and supporting consistent steam generation. High-grade insulation **(11)** surrounds the vessel to retain heat and improve overall energy efficiency.

Operators can monitor water levels via the water column and gauge **(12)**, which interfaces directly with the level control system to ensure safe operation. Sediment and scale buildup can be removed efficiently through the bottom blowdown drain **(13)**, helping to maintain water quality and prolong equipment life. Finally, isolating valves **(14)** allow critical components to be safely isolated for service or emergency purposes without requiring a full system shutdown.



1. Pressure Vessel
2. Power Feeds
3. Steam Outlet
4. Recirculation Pump
5. Motorized Drive System (Shield Actuator)
6. Pressure Safety Valve
7. Safety Cage
8. Manhole
9. Instrument Manifold
10. Feed Water Connection
11. Insulation
12. Water Column & Gauge
13. Bottom Blowdown Drain
14. Isolating Valves

Smart Control, Custom Features, Trusted Warranty

Intelligent Controls for Reliable Operation

Standard controls include:

- Freestanding NEMA 12 (IP54) control panel with touchscreen HMI
- Pre-programmed PLC for pressure, water level, and power tracking
- High/low water cut-offs and pressure limiters for safety
- MW demand tracking and real-time output modulation
- Remote monitoring and event logging (optional)

Electrical Requirements

Direct-to-Distribution Voltage Compatibility
Sequoia S is designed to operate directly on medium-voltage distribution systems, eliminating the need for step-down transformers and simplifying installation.

Typical specs:

- Voltage Range: 4.16 kV to 25 kV, 4-wire systems
- Frequency: 60 Hz standard
- Grounding: Pressure vessel and cage must be grounded to building steel and ground mat
- Breaker Connection: Designed for direct circuit breaker connection
- Startup Load: Full output in 30–40 minutes (cold start), <1 minute (hot start)

Options & Customizations

Available upgrades include:

- Duplex circulation pumps for redundancy
- Superheaters and steam separators
- Feedwater skid with deaeration
- Chemical dosing systems
- Modbus/BACnet integration
- Custom instrumentation packages
- Pre-piped blowdown tank
- Low-conductivity operation for high-purity steam

Warranty

All our immersed electrode boilers are conditionally warranted for the lesser of one year in operation or 18 months after shipment against defects in workmanship and material. Consult AERCO's standard published limited warranty terms and conditions for complete warranty information.

Specifications and Dimensions

Model	Voltage (kV)	Max Power Capacity (kW)	Steam Generation (212°F) feed Water at 175 psi (12 bar)Lbs/hr (T/hr)	Pressure Available psi (bar)	Boiler Diameter inch (mm)	Boiler Height inch (mm)	Initial Clearance Height for Power Feeds Insertion inch (mm)
CEJW-6	4.16 - 6.9	2,500 - 4,200	8,300 (3.8) - 14,000 (6.4)	100 (6.9) to 300 (21)	83 (2,100)	205 (5,200)	250 (6,400)
	10 - 13.8	6,000 - 10,000	20,100 (9.1) - 33,500 (15.2)				
CEJW-10	4.16 - 6.9	4,200 - 7,000	14,000 (6.4) - 23,400 (10.6)		100 (2,500)	225 (5,700)	270 (6,900)
	10 - 13.8	10,000 - 15,000	33,500 (15.2) - 50,200 (22.8)				
	20 - 25	18,000	60,300 (27.4)				
CEJW-15	4.16 - 6.9	6,500 - 10,000	21,700 (9.9) - 33,500 (15.2)		100 (2,500)	248 (6,300)	310 (7,800)
	10 - 13.8	15,000 - 20,000	50,200 (22.8) - 67,000 (30.4)				
	20 - 25	27,000	90,400 (41.1)				
CEJW-20	4.16 - 6.9	7,500 - 12,000	25,100 (11.4) - 40,200 (18.2)		115 (2,900)	270 (6,900)	355 (9,000)
	10 - 13.8	20,000 - 25,000	67,000 (30.4) - 83,700 (38)				
	20 - 25	32,000	107,000 (48.7)				

Besides the standard models, Sequoia S immersed electrode steam boilers are available to meet specific capacity and operating conditions by doubling the number of electrodes.

Other Sequoia Models

Sequioa

Immersed Electrode Hot Water Boiler

- **Zero Emissions & 100% Efficiency:** Ideal for eco-conscious operations and regulatory compliance
- **10:1 Turndown Ratio:** Seamless modulation from 10% to 100% output for demand flexibility
- **Fast Response Time:** Reaches full output in about one minute from hot standby
- **Compact & Scalable:** Available in 8 sizes from 2.5 MW to 68 MW with minimal footprint
- **Low Maintenance Design:** Long-life electrodes and fewer components reduce upkeep and downtime

Sequoia J

Immersed Electrode Steam Boiler

- **Up to 270,000 lb/hr Steam Output:** Supports high-pressure applications up to 500 psig
- **99.9% Efficiency:** Converts nearly all electrical energy into usable steam
- **Zero Combustion, Zero Emissions:** Ideal for decarbonization and clean energy goals
- **Direct High-Voltage Operation:** Connects to 4.16–25 kV, 4-wire systems
- **Compact, Low-Maintenance Design:** Jet-type electrode system reduces footprint and upkeep

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