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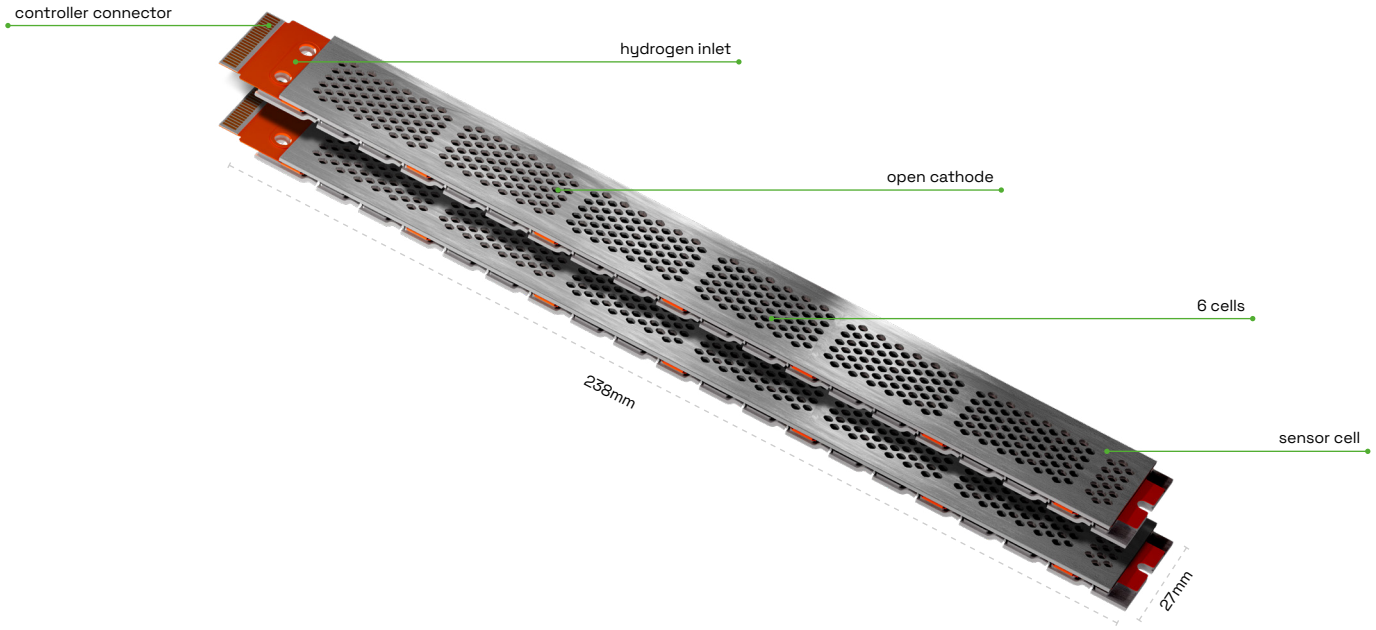
Technology overview



About Lamina®

Open Architecture Hydrogen Micro Fuel Cell

Lamina® is designed as a structurally simplified PEM fuel cell for applications requiring compactness, efficiency, and predictable behaviour without complex balance-of-plant systems.

Its defining feature is a fully open architecture:

- **Open Cathode**
  Ambient air is drawn directly from the environment, eliminating the need for closed air management systems, compressors, or complex ducting. This reduces mechanical overhead, system weight, and integration complexity while maintaining stable electrochemical performance within controlled operating ranges.

- **Open Anode**
  Hydrogen is supplied in a continuous flow configuration without recirculation loops. This enables near-complete hydrogen utilization, simplified fluidics, and deterministic system behaviour. The absence of anode recirculation components reduces failure points and supports a lightweight, ultra-thin design.

Lamina®

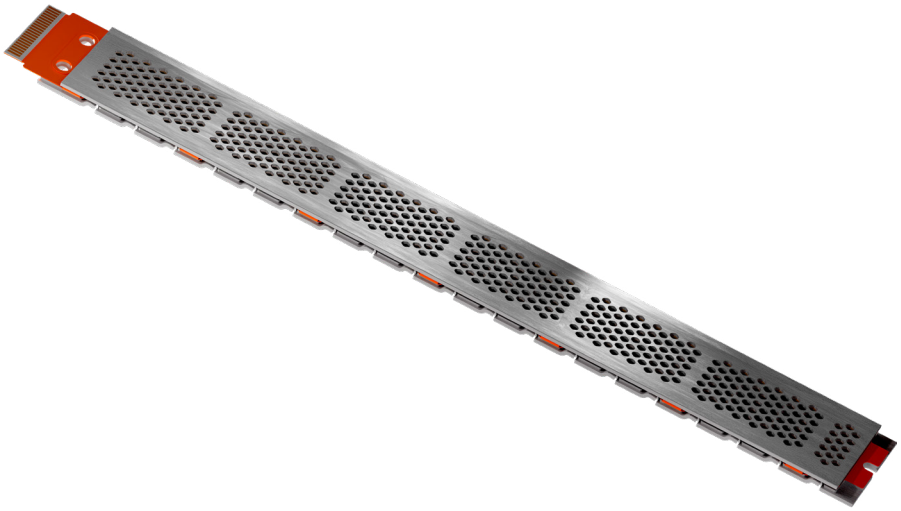
HYDROGEN MICRO FUEL CELL

Design Intent

Lamina® is built to minimize structural complexity around the fuel cell core.
By reducing auxiliary subsystems to the essential minimum, it enables:

- High hydrogen utilization
- Simplified integration
- Low mechanical overhead
- Predictable degradation behaviour

The result is a compact hydrogen fuel cell focused on efficiency, clarity, and scalable system integration — not balance-of-plant complexity.



Lamina® LS-10

Mechanical Characteristics

- Dimensions: 238 × 27 × 3.8 mm (L × W × H)
- Weight: 90 g
- Installation: Any orientation
- Form factor: Ultra-thin, integration-ready design

Electrical Performance

- Operating Voltage: 3.0 - 4.5 V
- Peak Power: 12 W
- Nominal Power: 10 W
- Minimum Continuous Power: 4 W

Efficiency & Utilization

- Fuel Cell Efficiency: 49%
- Hydrogen Utilization: 99%

Lifetime Performance

- End of Life (EOL) Power: 8 W
- Expected Lifetime: 3,000 h

Environmental Operating Conditions

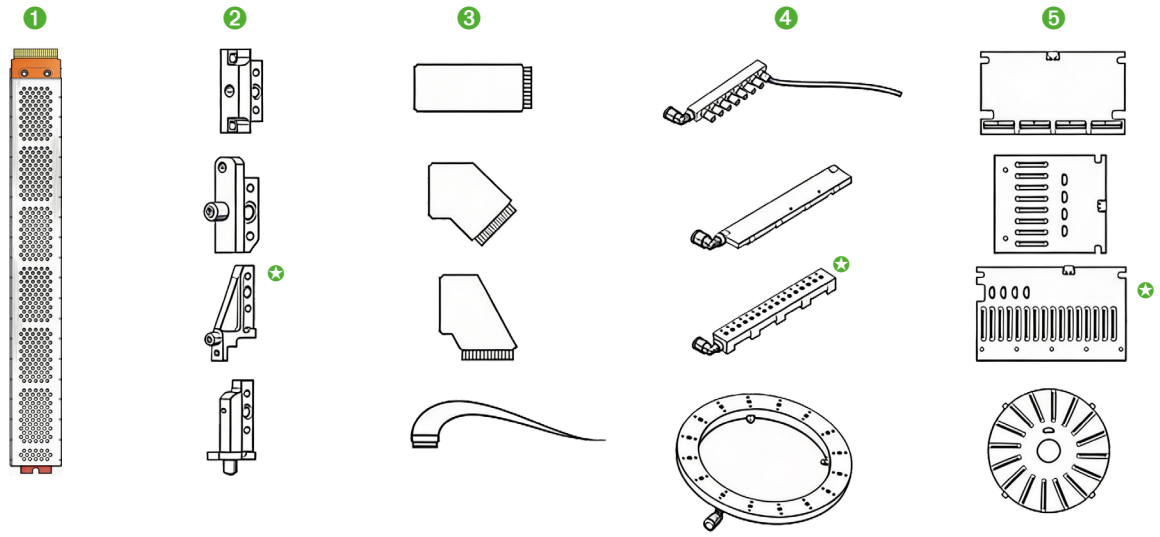
- Relative Humidity: 15–60 % RH
- Lamina® Temperature Range: 30–65 °C
- Minimum Starting Temperature: 3 °C

Required Hydrogen Purity

- 99,97 % (3,7) (SAE-J2719)

ModularKIT

SCALING POWER BY DESIGN



ModularKIT

Module

noun [c] // mɒd3.u:l

In engineering context: A module is the smallest meaningful system element that delivers a defined function and can be replicated to increase capacity, introduce redundancy, or simplify maintenance without increasing system complexity.

Flexibility

A new platform has arrived, one built for the creators who refuse to accept fixed form factors and rigid system designs.

Our ModularKIT isn't just a product; it's a way to configure hydrogen power like building blocks. Different shapes, different power levels, different cooling concepts, mixed, matched, scaled. We're not showing everything yet, but the ModularKIT will let developers build energy systems as freely as they design ideas.

ModularKIT - parts

Assembly Principle

Each vertical row represents a functional layer within the ModularKIT platform. Select one component from each row to create one complete hydrogen power module.

1 - Lamina®
2 - H2 adapters
3 - Flex adapters
4 - Manifolds
5 - Core PCB's

All components are engineered to mechanically and electrically interface with each other, allowing fast configuration without redesigning the core system architecture.

Different combinations result in different power outputs, geometries and cooling concepts, while the integration logic remains consistent: one component per row, assembled into one coherent energy unit.

✪ Modules marked with an asterisk are implemented in the ModularKIT 20L reference system shown on the next page, illustrating one example configuration of the platform.

ModularKIT 20LS

CONFIGURED EXAMPLE: 20LS PLATFORM

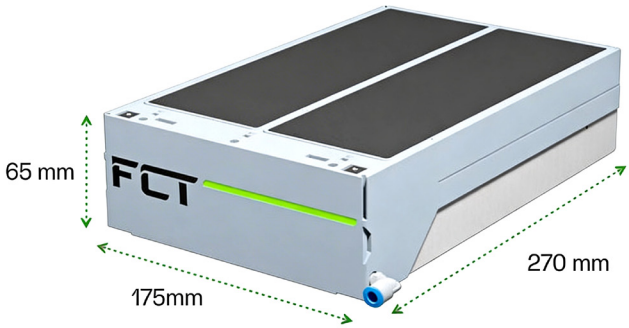
20LS Configuration

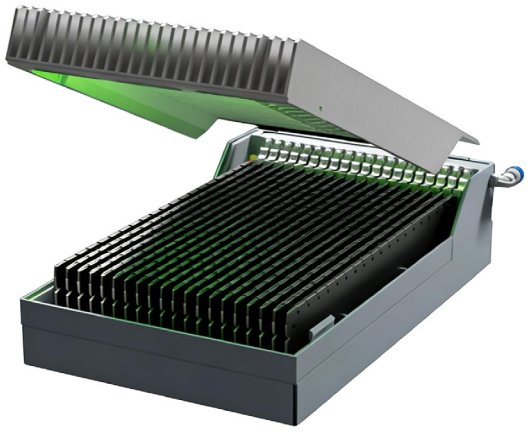
The 20LS configuration is our first fully assembled reference system based on the ModularKIT architecture. It integrates 20 Lamina® fuel cell units into a unified mechanical, fluidic, and electrical system using standardized manifolds, PCB assemblies, and defined connector interfaces. The resulting system provides approximately 180 W nominal output through parallel placed module aggregation.

Each Lamina® operates as an independent FuelCell unit, while the ModularKIT infrastructure manages:

- Hydrogen distribution via common manifold design
- Electrical aggregation through modular PCB topology
- Defined power routing and connector interfaces
- Structured mechanical alignment and fixation

Power scaling is achieved by controlled repetition of identical units within a predefined architecture. No redesign of the core fuel cell or system layout is required when increasing module count within the defined platform boundaries.





ModularKIT 20LS - Datasheet

System Overview

- Total System Output: 180 W nominal
- Architecture: Parallel modular fuel cell assembly
- Core Technology: Lamina® PEM Micro Fuel Cells
- The reference system aggregates multiple Lamina® units into a unified power platform using our standardized mechanical, electrical, and fluidic Modules.

Lifetime Performance

- Beginning of Life BOL Power: 180 W
- End of Life EOL Power: 144 W
- Expected Lifetime: 3,000 h

Environmental Operating Conditions

The modular kit is designed for start-up at ambient temperatures down to 3 °C. During operation, the cooling system shall maintain the Lamina® fuel cell within its internal operating temperature range of 30 °C to 65 °C and a relative humidity of 15-60% RH.

Scan or click the QR-code to contact us.

Instrumentvägen 12A
SE-194 51 Upplands Väsby