SILYZER 200
High-pressure efficiency in the megawatt range

siemens.com/hydrogen-electrolyzer
Using hydrogen: Powering ahead into the future

Hydrogen is one of the best answers to the question of how to make energy cleaner, more powerful, and more cost-effective. It’s being used extensively in many industries today – and the demand continues to grow.

Clean solution. The SILYZER.
Innovative solutions are needed to generate a sufficient supply of hydrogen. Solutions such as the SILYZER product line from Siemens, an innovative electrolysis system that uses wind and solar energy to produce hydrogen – with absolutely no CO₂-emission. This makes SILYZER twice as useful – and always clean.

Thinking ahead. To PEM electrolysis.
The Siemens SILYZER takes the known principle of electrolysis one step further – with the Proton Exchange Membrane (PEM). Permeable to protons, the membrane acts as a separator, among other things, making it possible to eliminate the use of caustic potash. The electrolyte replacement is thus pure water – a real environmental advantage when it comes to operations.

Worth more. Benefits that pay off.
Hydrogen is a versatile and frequently used energy source. A good reason to use new, environmentally safe production methods. SILYZER sets new standards in this area. Not only can it absorb large amounts of solar and wind energy and produce hydrogen without any CO₂ emissions, but it’s also cost-effective. You benefit from tremendous advantages that really pay off. Talk to us. We’re here for you.
**Generation and consumption: Opportunities for industry**

From optimizing the power demand profile to dynamic hydrogen production, SILYZER is a clean and efficient solution for modern industrial plants. This means that even excess energy produced in-house can be sensibly used, rather than wasted. This is what economical and dynamic hydrogen production looks like. And SILYZER also has a lot to offer those who only consume hydrogen. Among other things, it is used for shielding gas in the production of flat glass and for synthesis gas in the chemical industry. Or as a reduction agent in metalworking plants and for hardening fats in the food industry. On-site production not only cuts transportation and logistics costs but also maximizes operational safety while ensuring high availability.

**A dynamic enhancement: Flexible in the power grid**

From power-to-gas to a secure power supply. As an addition to modern power grids, SILYZER ensures maximum reliability.

It’s a load component that compensates supply fluctuations in the power grid and stabilizes the grid. It also facilitates the previously difficult storage of vast quantities of energy, which can be converted back into electricity as needed. In other words: maximum flexibility for energy services in any situation – while minimizing the CO₂ footprint.

**Emission-free transportation: Logistics and mobility**

H₂ fuel cells are used in everything from pallet trucks to large bus fleets. When hydrogen is produced as a fuel right on the premises, plants benefit in multiple ways – whether from the high availability of the fuel produced in-house, low-emissions operation of vehicles such as fork lifts and factory floor conveyors, and from valuable time savings due to shorter fueling times and elimination of the need to change batteries. More and more mass transit operators are also turning to hydrogen-driven vehicles. Long ranges, no emissions, and fast fueling are some of the benefits enjoyed in passenger service. Hydrogen mobility is thus a key component of efforts to improve the quality of life in cities – thanks to improved air quality and reduced noise.
SILYZER 200: High-pressure efficiency

Maximum flexibility, maximum value: A modular design and practical expansion options allow the SILYZER 200 to be custom-designed to meet varying requirements.

Efficient production. With PEM.
SILYZER 200 features PEM-based high-pressure electrolysis. Hydrogen-generation technology, which is relatively new, offers significant improvements in both efficiency and environmental compatibility when compared to classic electrolysis. You benefit from the enormous potential of PEM technology. It’s low-maintenance, free of hazardous substances, and the hydrogen obtained is extremely pure, with no sulfur, nitrogen, or carbon residues.

Genius in a box. SILYZER 200.
The Siemens SILYZER 200 has a modular design which makes it adaptable to your specific needs, providing you with maximum flexibility.

The basic system consists of at least one 1.25 MW skid. Multiple basic systems can be combined into a PEM electrolysis network that delivers up to 20 MW and beyond. Depending on your needs, a variety of technical options round out the complete package, including a recooling system, water treatment system, power grid connection, and much more. Of course, all components are perfectly compatible.

SILYZER 200, the most powerful system on the market, is the first PEM electrolysis system to exceed the megawatt range. And its highly dynamic operation allows it to be operated in the overload mode. It also effortlessly handles hydrogen production when operated under high pressure of up to 35 bar – a direct benefit for you, our valued customer.

SILYZER 200 basic system
Technical data

<table>
<thead>
<tr>
<th>Electrolysis type/principle:</th>
<th>PEM (Proton Exchange Membrane)</th>
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<tbody>
<tr>
<td>Rated stack capacity:</td>
<td>1.25 MW</td>
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<tr>
<td>Skid dimensions:</td>
<td>6.30 m x 3.10 m x 3.00 m</td>
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<tr>
<td>Startup time:</td>
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<tr>
<td>Output pressure:</td>
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<td>Hydrogen purity (dep. on operating point):</td>
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<td>Hydrogen quality 5.0:</td>
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<td>Hydrogen production under nominal load:</td>
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<td>Life cycle design:</td>
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<td>Weight:</td>
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<td>CE conformity:</td>
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<tr>
<td>Fresh water demand:</td>
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Simply intelligent:
A truly clever system

SiLYZER 200 merges future-oriented technology with the present – via a wide range of perspectives for industry, power and gas grid operators, and tomorrow’s mobility. But the intelligent system takes these features one step further – and simply offers a clever, Siemens-inspired, advantage.

Siemens inside. Based on quality.
A great deal of high tech and expertise goes into SiLYZER 200. With proven Siemens quality, of course. This includes our SIMATIC PCS7 control system and converters, members of the SINAMICS DCM family, among others. This perfect alignment between all components sets the groundwork for a safe and reliable hydrogen generating system. The full range of experience is bundled into one, forming a high quality, economical product which allows you to achieve benchmark-setting operation. Of that, you can be sure.

Service packages. Perfectly tailored.
This is what a simple and efficient service concept looks like: We put together the perfect package to meet your needs.

From fast, straightforward 24/7 support – to a comprehensive full-service package. You benefit from Siemens’ global service expertise.

Don’t wait for tomorrow!
The SiLYZER 200 system takes sustainability one step further. It produces hydrogen with electricity from renewable energy sources, making production entirely CO₂-free. And it’s more cost-effective than ever before, thanks to the well-conceived SiLYZER technology. That’s not an abstract promise – it’s a fact, right here and now.
### Advantages for industry

- CO$_2$-free, on-site production – no transportation or logistics costs
- Faster on/off operation without preheating, high availability
- Maximum operating safety – non-corrosive
- Nearly maintenance-free operation with proven components
- Marginal energy requirements in standby mode
- Easy to integrate into existing control systems

### Advantages for logistics and municipalities

- No harmful emissions on the factory floor
- Consistently strong performance, with high availability at all charge levels
- No need to change batteries, no lengthy charging cycles
- Short refueling times for vehicles
- Green mass transit without CO$_2$ emissions
- Long ranges for passenger service
- Improved air quality in cities
- Significant reduction in traffic noise
- Independence from fossil fuels

### Advantages for operators and grid service providers

- Dynamics in milliseconds for optimum yield in the use of excess energy
- Generates hydrogen as an operationally safe, valuable energy source
- Robust, reliable, and safe
- Reliable load component for balancing energy
- Innovative power-to-gas concepts
- Key component for energy storage and reconversion
A master in practice: SILYZER in action

Mobility of the future, modern industry, and reliable grid services: SILYZER is already in use everywhere. With great success – as demonstrated by our solid examples.

1 Metalworking. Better planning at lower cost.

The metalworking industry is one of the sectors where hydrogen consumption is growing. Increasing production rates mean that our customers need a way to cover higher hydrogen demands in conjunction with shrinking CO₂ limits. SILYZER saves the customers money, allowing them to produce their own hydrogen on-site, right where they need it. And under the best terms, 100% ecologically. With the special added benefit: the customers have a positive effect on their energy management system. If too much energy is generated, the excess can be used in practical ways by converting and storing it. A clever solution and double the benefits.

2 Power grids. Available and stable.

Grid stability and supply security: These concerns are a priority for our customer. Regional grid service providers increasingly rely on wind and solar power. And SILYZER helps these customers to be prepared for on-demand energy provision at any given time.

As a dynamic load component in the balancing power market, SILYZER offsets supply fluctuations in the power grid. In doing so, it plays a strategic role for our customers. And yet, the ability to store the hydrogen also offers enormous potential. Considering reconversion into electricity, the so-formed energy storage provides both negative and positive reserve power for short to very long periods of time. The hydrogen can also be fed directly into the gas grid.

Operators of wind turbines and photovoltaic plants will also rely on SILYZER in the future. Attention is being focused not only on the risk of financial losses, but also on the opportunity for marketing wind and solar power directly.

3 Intralogistics. Reliable and low-cost.

Forklifts are often in constant use in warehouses and factories. This creates a high demand for energy – even in vehicles that use fuel cells. Our customers need a hydrogen supply that’s always reliable, and SILYZER provides the solution.

In practice, on-site production has many benefits. Like the new savings potential. The elimination of transportation and infrastructure costs for hydrogen deliveries is a major plus from the start. And another noticeable advantage: SILYZER ensures economical hydrogen production, price stability, and independence from fossil fuels, which is an increasingly important factor.