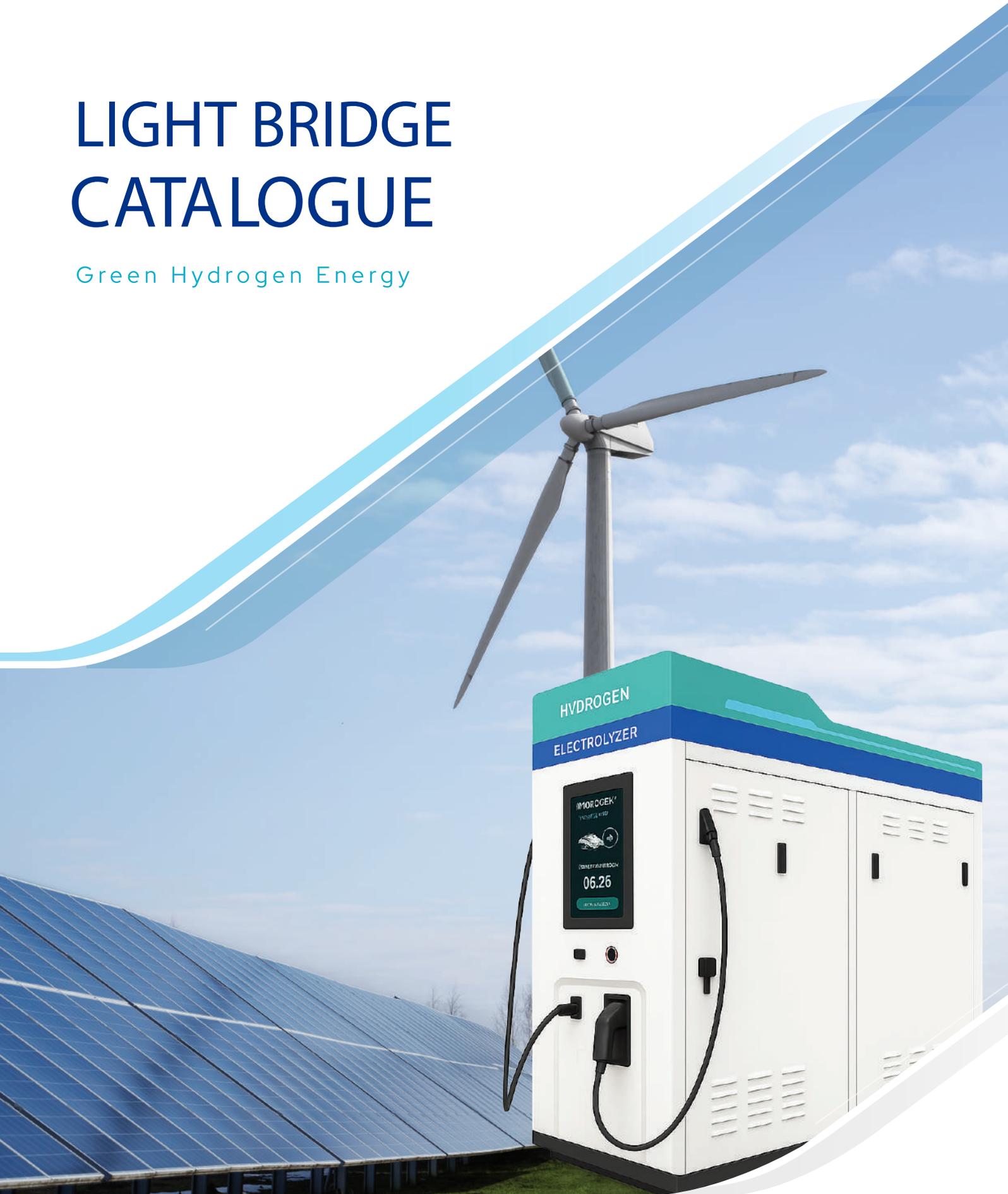


# LIGHT BRIDGE CATALOGUE

Green Hydrogen Energy







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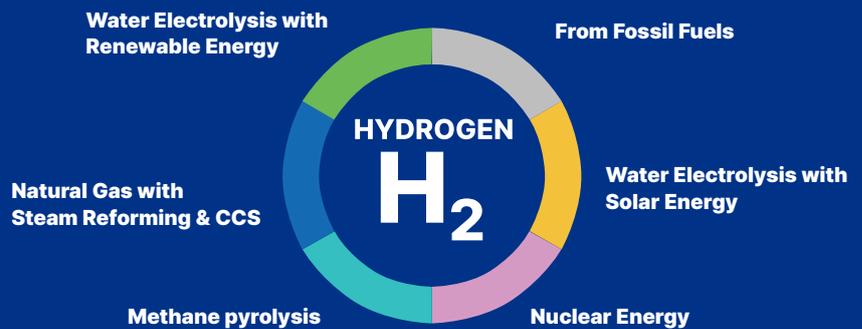
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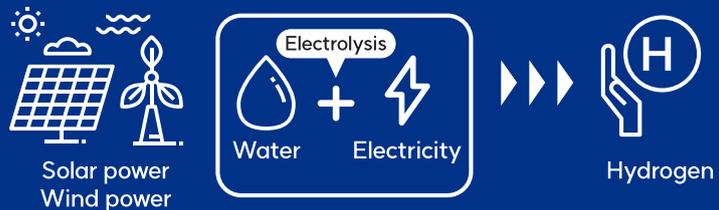
# Intro

## Classification according to production method



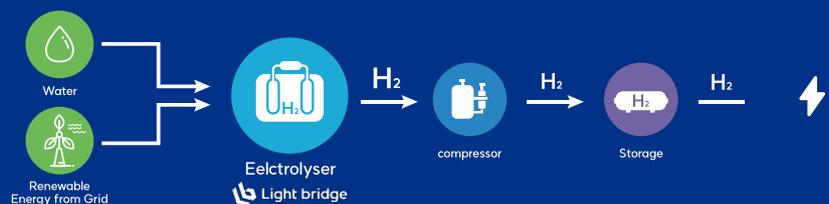
## What is green hydrogen?

### Water electrolysis hydrogen



- **Hydrogen produced by water electrolysis from renewable energy**
- **Clean, unlimited energy source**
- **Role as an energy carrier**
- **Best energy source for decarbonization**
- **Key to democratization of Economy and energy**

## Green Hydrogen Cogeneration



# Electrolyser Types Available by LightBridge

## AEL water electrolysis

### Advantages

- Proven technology
- Cheaper catalysts
- Longer Lifetime
- Relatively low investment cost

### Disadvantages

- Low current density
- Large and complicated system
- Lower gas purity
- Lower operable pressure

## PEM water electrolysis

### Advantages

- Higher current density
- Higher efficiency
- Operable with higher pressure

### Disadvantages

- Expensive catalysts
- Durability decreases faster over time
- Difficult to manufacture sizable stack

## AEM water electrolysis

Launched  
2024 Q4

### Advantages

- Higher current density
- Higher efficiency
- Cheaper catalysts
- Operable with higher pressure

### Disadvantages

- Low durability
- Membrane verification required
- Difficult to manufacture sizable stack

## Water Electrolysis Comparison

	AEL	PEM	AEM
Cost	Low	High	Low
Capacity	100 MW+	10 MW+	Up to 1 MW
Operating pressure	Low	High	High
Operating temperature	Low	Low	Low
Current density	Low	High	High
Electrolyte	Liquid (KOH ~30wt%)	Solid	Solid
Energy efficiency	Low	High	Varying (R&D stage)
Hydrogen purity	99.5 - 99.9%	99.97 - 99.99%	99.9%
Durability	High	Low	Decent



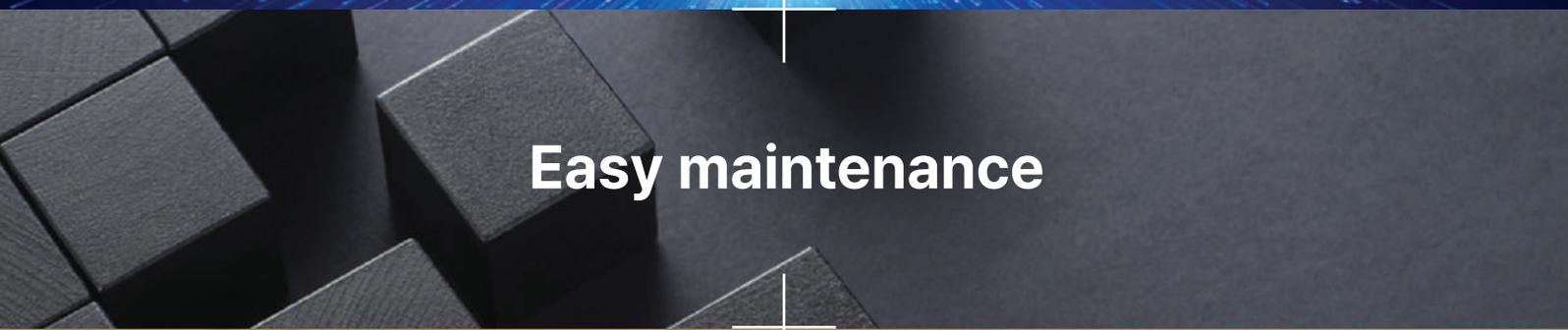
# Why LightBridge?



**Compact Electrolyser**



**Easily Scalable**



**Easy maintenance**



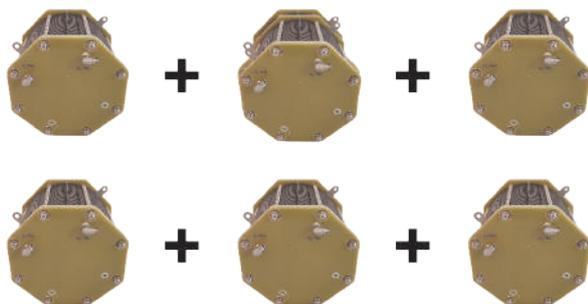
**Mass production**

Lightbridge aims at zero carbon and green growth,  
leading a sustainable future.

# Technique and Industrial Strategy

## Technical Competitiveness

Light Bridge offers reduced size of 1/10 compared to other electrolyzer products in the market.

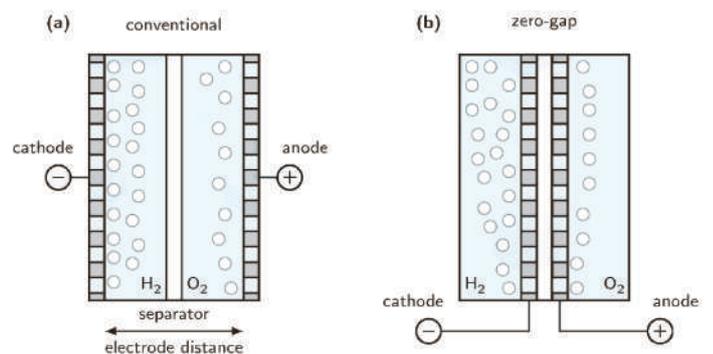


## Stack comparison

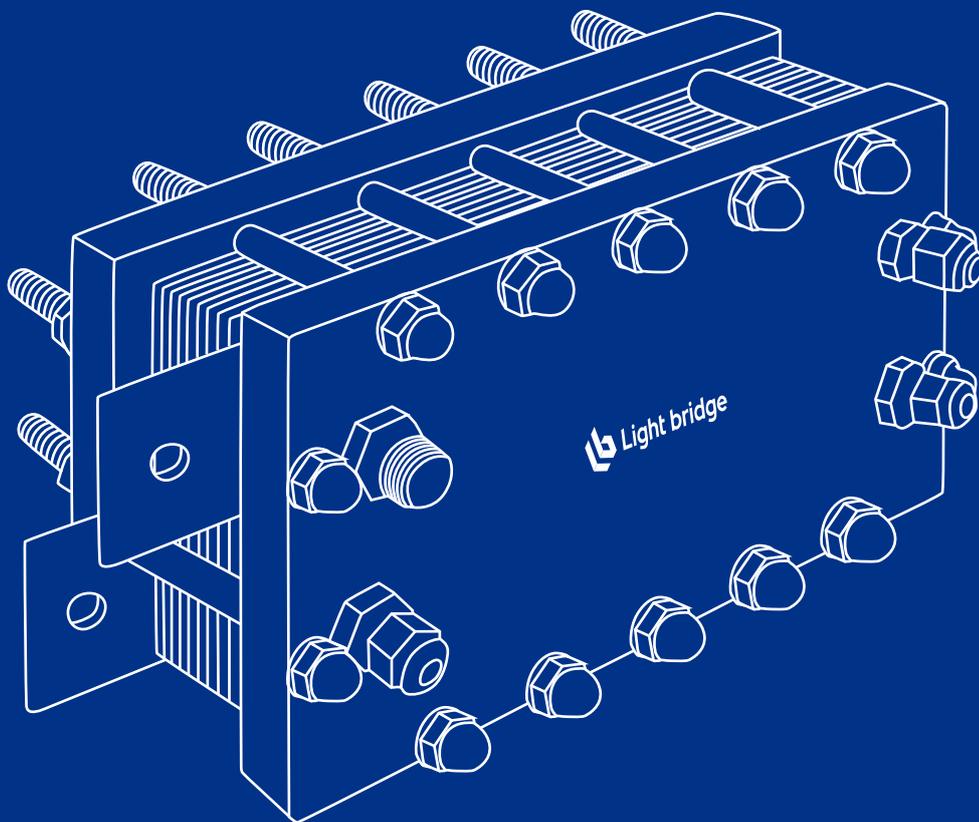
Light Bridge can scale up by connecting stacks in parallel series and using a modularized unit stack instead of one large stack.

## Cell design: Zero-gap configuration

- More complex design
- Requires use of porous electrodes
- Better cell performance
- Higher efficiency
- Allows for a more compact design
- Can obtain higher current density
- Reduces Ohmic resistance contribution from electrolyte
- Forces gas bubbles to be released from backside of electrode

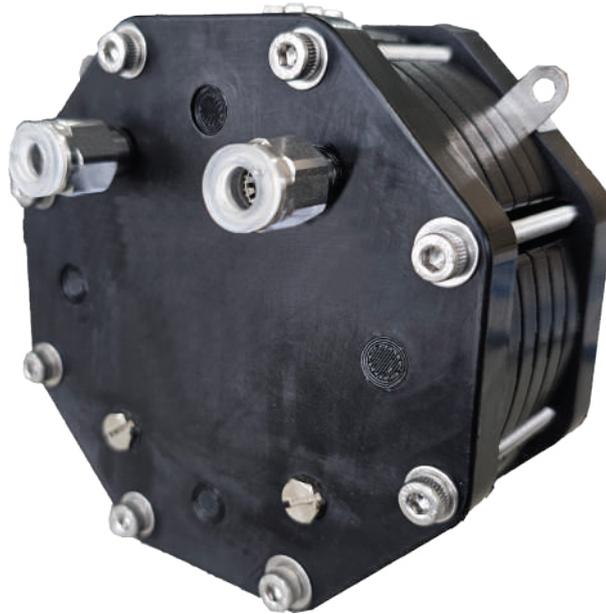


# Stack



- LBE-SC
- LBE-C
- LBE-ASC
- LBE-AC
- LBE-PC

# 01 LBE-SC



- ▶ LBE-SC Series are compact alkaline-type electrolyser stacks with a range of 1~20 cells and a power capacity of 5 to 300 watts. Hydrogen and oxygen are generated through the electrolysis of water using a KOH (Potassium Hydroxide) electrolyte.
- ▶ Our high-efficiency nickel-based electrode technology, developed from Light-Bridge's core expertise, reduces overall system production cost and enables hydrogen generation with a high yield per input power. This nickel-based electrode technology provides a long operational life of over 70,000 hours, with the estimated lifetime of our alkaline electrolyser stacks reaching up to 100,000 operational hours.
- ▶ Hydrogen produced from the water electrolyser is used as the energy storage medium for HESS (Hydrogen Energy Storage System). LightBridge offers electrolyzers that can be powered by renewable energy sources such as solar, wind, tidal, geothermal, night-time electricity, and surplus power. Hydrogen can be converted back into electricity through a fuel cell when required.

# LBE-SC Series

## Alkaline Electrolyser Small Stack 1~20 Cell



LBE-1SC



LBE-3SC



LBE-10SC

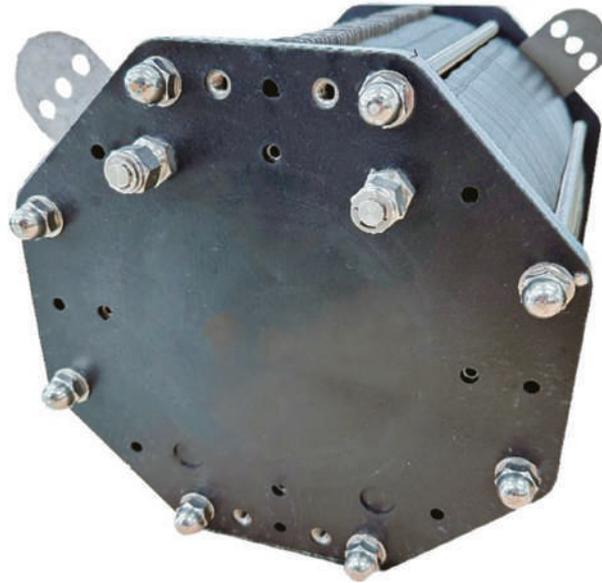


Material of Electrode	Membrane	Voltage Range @0.5A/cm <sup>2</sup>	Operating Temperature Range	Electrolytes	Inlet Water Type (ASTM)	Active Area per Cell
Ni	Porous Polymer Membrane	1.80~1.85V/Cell	40~60°C	Alkali Solution (KOH, 30wt%)	Type II or III Distilled Water	15.2cm <sup>2</sup>

Cell	Model name	Size(mm) (W x H x L)	Weight (kg)	H <sub>2</sub> Flow rate (Nm <sup>3</sup> /h)	O <sub>2</sub> Flow rate (Nm <sup>3</sup> /h)	Electrolyte Circulation flow rate(LPM)	Applied Voltage range (V)	Power Capacity (W@1.8V)
1	LBE-1SC	100 X 100 X 27	0.57	0.0032	0.0016	1~1.5	1.7~2.0	13.67
2	LBE-2SC	100 X 100 X 33	0.64	0.0063	0.0032	1~1.5	3.4~4.0	27.34
3	LBE-3SC	100 X 100 X 39	0.71	0.0095	0.0048	1~1.5	5.1~6.0	41.01
4	LBE-4SC	100 X 100 X 45	0.78	0.0127	0.0063	1~1.5	6.8~8.0	54.68
5	LBE-5SC	100 X 100 X 51	0.85	0.0159	0.0079	1~1.5	8.5~10.0	68.36
6	LBE-6SC	100 X 100 X 57	0.92	0.0190	0.0095	1~1.5	10.2~12.0	82.03
7	LBE-7SC	100 X 100 X 63	0.99	0.0222	0.0111	1~1.5	11.9~14.0	95.70
8	LBE-8SC	100 X 100 X 69	1.06	0.0254	0.0127	1~1.5	13.6~16.0	109.37
9	LBE-9SC	100 X 100 X 75	1.13	0.0286	0.0143	1~1.5	15.3~18.0	123.04
10	LBE-10SC	100 X 100 X 81	1.20	0.0317	0.0159	1~1.5	17.0~20.0	136.71
11	LBE-11SC	100 X 100 X 87	1.27	0.0349	0.0175	2~2.5	18.7~22.0	150.38
12	LBE-12SC	100 X 100 X 93	1.34	0.0381	0.0190	2~2.5	20.4~24.0	164.05
13	LBE-13SC	100 X 100 X 99	1.41	0.0413	0.0206	2~2.5	22.1~26.0	177.72
14	LBE-14SC	100 X 100 X 105	1.48	0.0444	0.0222	2~2.5	23.8~28.0	191.39
15	LBE-15SC	100 X 100 X 111	1.55	0.0476	0.0238	2~2.5	25.5~30.0	205.07
16	LBE-16SC	100 X 100 X 117	1.62	0.0508	0.0254	2~2.5	27.2~32.0	218.74
17	LBE-17SC	100 X 100 X 123	1.69	0.0539	0.0270	2~2.5	28.9~34.0	232.41
18	LBE-18SC	100 X 100 X 129	1.76	0.0571	0.0286	2~2.5	30.6~36.0	246.08
19	LBE-19SC	100 X 100 X 135	1.83	0.0603	0.0301	2~2.5	32.3~38.0	259.75
20	LBE-20SC	100 X 100 X 141	1.90	0.0635	0.0317	2~2.5	34.0~40.0	273.42

※ Intermediate cell configurations are available; Please contact us for custom requirements.

# 02 LBE-C



- ▶ LBE-C Series are large-sized alkaline-type electrolyser stacks with a range of 1~48 cells and a power capacity of 60 watts to 9.6 kilowatts. Hydrogen and oxygen are generated through the electrolysis of water using a KOH (Potassium Hydroxide) electrolyte.
- ▶ Our high-efficiency nickel-based electrode technology, developed from Light-Bridge's core expertise, minimizes system production cost and maximizes hydrogen yield per unit of input power. This nickel-based electrode technology offers a long service life of more than 70,000 hours, and the estimated lifetime of our alkaline electrolyser stacks is approximately 100,000 operational hours.
- ▶ Hydrogen produced from the water electrolyser is used as the energy storage medium for HESS (Hydrogen Energy Storage System). LightBridge offers electrolyzers that can be powered by renewable energy sources such as solar, wind, tidal, geothermal, night-time electricity, and surplus power. Hydrogen can be converted back into electricity through a fuel cell when required.

# LBE-C Series

## Alkaline Electrolyser Large Stack 1~48 Cell



LBE-5C



LBE-10C



LBE-48C

LBE-    C

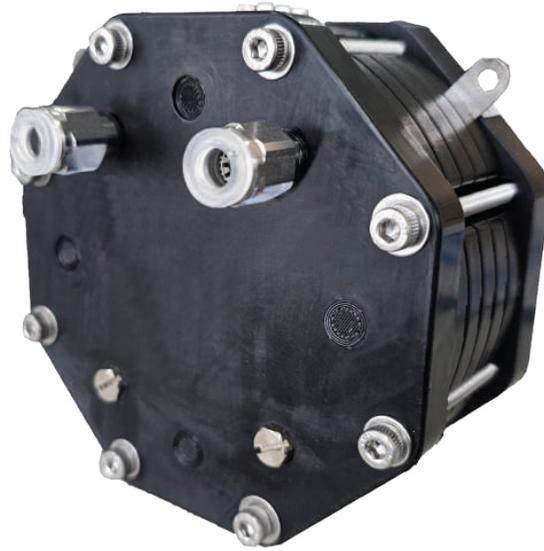
Number of Cells

Material of Electrode	Membrane	Voltage Range @0.5A/cm <sup>2</sup>	Operating Temperature Range	Electrolytes	Inlet Water Type (ASTM)	Active Area per Cell
Ni	Porous Polymer Membrane	1.80~1.85V/Cell	40~60°C	Alkali Solution (KOH, 30wt%)	Type II or III Distilled Water	176.6cm <sup>2</sup>

Cell	Model name	Size(mm) (W x H x L)	Weight (kg)	H <sub>2</sub> Flow rate (Nm <sup>3</sup> /h)	O <sub>2</sub> Flow rate (Nm <sup>3</sup> /h)	Electrolyte Circulation flow rate(LPM)	Applied Voltage range (V)	Power Capacity (W@1.8V)
1	LBE-1C	265 X 265 X 92	10.10	0.037	0.018	>2	1.7~2.0	158.94
2	LBE-2C	265 X 265 X 98	10.82	0.074	0.037	2~	3.4~4.0	317.88
3	LBE-3C	265 X 265 X 104	11.55	0.111	0.055	2~	5.1~6.0	476.82
4	LBE-4C	265 X 265 X 110	12.28	0.148	0.074	2~	6.8~8.0	635.76
5	LBE-5C	265 X 265 X 116	13.01	0.184	0.092	2~	8.5~10.0	794.70
6	LBE-6C	265 X 265 X 122	13.74	0.221	0.111	2~	10.2~12.0	953.64
7	LBE-7C	265 X 265 X 128	14.47	0.258	0.129	2~	11.9~14.0	1,112.58
8	LBE-8C	265 X 265 X 134	15.20	0.295	0.148	2~	13.6~16.0	1,271.52
9	LBE-9C	265 X 265 X 140	15.93	0.332	0.166	2~	15.3~18.0	1,430.46
10	LBE-10C	265 X 265 X 146	16.66	0.369	0.184	2~	17.0~20.0	1,589.40
11	LBE-12C	265 X 265 X 158	18.12	0.443	0.221	2~	20.4~24.0	1,907.28
12	LBE-20C	265 X 265 X 246	23.96	0.738	0.369	4~	34.0~40.0	3,178.80
13	LBE-24C	265 X 265 X 270	26.88	0.885	0.443	4~	40.8~48.0	3,814.56
14	LBE-30C	265 X 265 X 306	31.26	1.107	0.553	6~	51.0~60.0	4,768.20
15	LBE-40C	265 X 265 X 366	43.67	1.476	0.738	8~	68.0~80.0	6,357.60
16	LBE-48C	265 X 265 X 420	44.40	1.771	0.885	8~	81.6~96.0	7,629.12

※ Intermediate cell configurations are available; Please contact us for custom requirements.

## 03 LBE-ASC



- ▶ LBE-ASC Series are next-generation anion exchange membrane (AEM) type electrolyser stacks with a range of 1~20 cells and a power capacity of 5~300 watts.
- ▶ The AEM electrolyser generates hydrogen and oxygen by electrolyzing water using 1 M KOH aqueous solution as a supporting electrolyte. By applying a solid polymer-based anion exchange membrane (AEM), the system reduces the handling burden of high-concentration alkaline solutions, simplifies the system design, and improves maintenance convenience.
- ▶ LightBridge has developed high-efficiency nickel-based electrodes and membrane electrode assemblies (MEA) based on its core technology. This technology increases hydrogen production yield per unit input power and lowers system manufacturing cost. The electrodes and membranes have demonstrated durability over tens of thousands of operating hours, and development is underway toward a target of 100,000 operational hours.
- ▶ Hydrogen produced from the water electrolyser is used as the energy storage medium for HESS (Hydrogen Energy Storage System). LightBridge offers electrolysers that can be powered by renewable energy sources such as solar, wind, tidal, geothermal, night-time electricity, and surplus power. Hydrogen can be converted back into electricity through a fuel cell when required.

# LBE-ASC Series

## Anion Exchange Membrane Electrolyser Small Stack 1~20 Cell



LBE-A1SC



LBE-A3SC



LBE-A5SC

LBE- A    SC

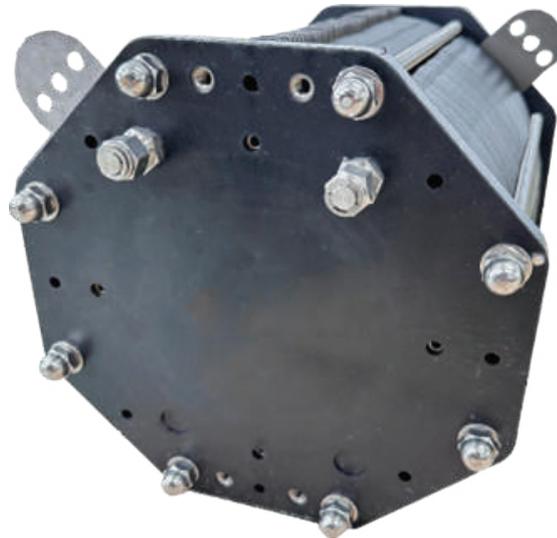
Number of Cells

Material of Electrode	Membrane	Voltage Range @0.5A/cm <sup>2</sup>	Operating Temperature Range	Electrolytes	Inlet Water Type (ASTM)	Active Area per Cell
Ni, Fe, Pt	Solid Polymer-based Anion Exchange Membrane	1.80~1.85V/Cell	40~60°C	Alkali Solution (1 M KOH)	Type II or III Distilled Water	15.2cm <sup>2</sup>

Cell	Model Name	Size (mm) (W x H x L)	Weight (kg)	H2 Flow Rate (Nm <sup>3</sup> /h)	O2 Flow Rate (Nm <sup>3</sup> /h)	Electrolyte Circulation flow Rate (LPM)	Applied Voltage Range (V)	Power Capacity (W@1.8V)
1	LBE-A1SC	100 X 100 X 27	0.57	0.0032	0.0016	1~1.5	1.7~2.0	13.67
2	LBE-A2SC	100 X 100 X 33	0.64	0.0063	0.0032	1~1.5	3.4~4.0	27.34
3	LBE-A3SC	100 X 100 X 39	0.71	0.0095	0.0048	1~1.5	5.1~6.0	41.01
4	LBE-A4SC	100 X 100 X 45	0.78	0.0127	0.0063	1~1.5	6.8~8.0	54.68
5	LBE-A5SC	100 X 100 X 51	0.85	0.0159	0.0079	1~1.5	8.5~10.0	68.36
6	LBE-A6SC	100 X 100 X 57	0.92	0.0190	0.0095	1~1.5	10.2~12.0	82.03
7	LBE-A7SC	100 X 100 X 63	0.99	0.0222	0.0111	1~1.5	11.9~14.0	95.70
8	LBE-A8SC	100 X 100 X 69	1.06	0.0254	0.0127	1~1.5	13.6~16.0	109.37
9	LBE-A9SC	100 X 100 X 75	1.13	0.0286	0.0143	1~1.5	15.3~18.0	123.04
10	LBE-A10SC	100 X 100 X 81	1.20	0.0317	0.0159	1~1.5	17.0~20.0	136.71
11	LBE-A11SC	100 X 100 X 87	1.27	0.0349	0.0175	2~2.5	18.7~22.0	150.38
12	LBE-A12SC	100 X 100 X 93	1.34	0.0381	0.0190	2~2.5	20.4~24.0	164.05
13	LBE-A13SC	100 X 100 X 99	1.41	0.0413	0.0206	2~2.5	22.1~26.0	177.72
14	LBE-A14SC	100 X 100 X 105	1.48	0.0444	0.0222	2~2.5	23.8~28.0	191.39
15	LBE-A15SC	100 X 100 X 111	1.55	0.0476	0.0238	2~2.5	25.5~30.0	205.07
16	LBE-A16SC	100 X 100 X 117	1.62	0.0508	0.0254	2~2.5	27.2~32.0	218.74
17	LBE-A17SC	100 X 100 X 123	1.69	0.0539	0.0270	2~2.5	28.9~34.0	232.41
18	LBE-A18SC	100 X 100 X 129	1.76	0.0571	0.0286	2~2.5	30.6~36.0	246.08
19	LBE-A19SC	100 X 100 X 135	1.83	0.0603	0.0301	2~2.5	32.3~38.0	259.75
20	LBE-A20SC	100 X 100 X 141	1.90	0.0635	0.0317	2~2.5	34.0~40.0	273.42

※ Intermediate cell configurations are available; Please contact us for custom requirements.

# 04 LBE-AC



## LIGHT BRIDGE PRODUCTS

- ▶ LBE-AC Series are next-generation anion exchange membrane (AEM) type electrolyser stacks with a range of 1~48 cells and a power capacity of 60 watts to 9.6 kilowatts.
- ▶ The AEM electrolyser generates hydrogen and oxygen by electrolyzing water using 1 M KOH aqueous solution as a supporting electrolyte. The application of a solid polymer-based anion exchange membrane (AEM) reduces the handling difficulty of highly concentrated alkaline solutions, while simplifying the system and improving maintenance efficiency.
- ▶ LightBridge has developed high-efficiency nickel-based electrodes and membrane electrode assemblies (MEA) based on its core technology. This development enhances hydrogen yield per input power and reduces the overall production cost. The electrode and membrane technology have proven durability over tens of thousands of hours, and are being developed with a target of 100,000 operational hours.
- ▶ Hydrogen produced from the water electrolyser is used as the energy storage medium for HESS (Hydrogen Energy Storage System). LightBridge offers electrolysers that can be powered by renewable energy sources such as solar, wind, tidal, geothermal, night-time electricity, and surplus power. Hydrogen can be converted back into electricity through a fuel cell when required.

# LBE-AC Series

## Anion Exchange Membrane Electrolyser Large Stack 1~48 Cell



LBE-A3C



LBE-A24C



LBE-A48C

LBE- A   C

Number of Cells

Material of Electrode	Membrane	Voltage Range @0.5A/cm <sup>2</sup>	Operating Temperature Range	Electrolytes	Inlet Water Type (ASTM)	Active Area per Cell
Ni, Fe, Pt	Solid Polymer-based Anion Exchange Membrane	1.80~1.85V/Cell	40~60°C	Alkali Solution (1 M KOH)	Type II or III Distilled Water	176.6cm <sup>2</sup>

Cell	Model name	Size(mm) (W x H x L)	Weight (kg)	H2 Flow rate (Nm3/h)	O2 Flow rate (Nm3/h)	Electrolyte Circulation flow rate(LPM)	Applied Voltage range (V)	Power Capacity (W@1.8V)
1	LBE-A1C	265 X 265 X 92	10.10	0.037	0.018	>2	1.7~2.0	158.94
2	LBE-A2C	265 X 265 X 98	10.82	0.074	0.037	2~	3.4~4.0	317.88
3	LBE-A3C	265 X 265 X 104	11.55	0.111	0.055	2~	5.1~6.0	476.82
4	LBE-A4C	265 X 265 X 110	12.28	0.148	0.074	2~	6.8~8.0	635.76
5	LBE-A5C	265 X 265 X 116	13.01	0.184	0.092	2~	8.5~10.0	794.70
6	LBE-A6C	265 X 265 X 122	13.74	0.221	0.111	2~	10.2~12.0	953.64
7	LBE-A7C	265 X 265 X 128	14.47	0.258	0.129	2~	11.9~14.0	1,112.58
8	LBE-A8C	265 X 265 X 134	15.20	0.295	0.148	2~	13.6~16.0	1,271.52
9	LBE-A9C	265 X 265 X 140	15.93	0.332	0.166	2~	15.3~18.0	1,430.46
10	LBE-A10C	265 X 265 X 146	16.66	0.369	0.184	2~	17.0~20.0	1,589.40
11	LBE-A12C	265 X 265 X 158	18.12	0.443	0.221	2~	20.4~24.0	1,907.28
12	LBE-A20C	265 X 265 X 246	23.96	0.738	0.369	4~	34.0~40.0	3,178.80
13	LBE-A24C	265 X 265 X 270	26.88	0.885	0.443	4~	40.8~48.0	3,814.56
14	LBE-A30C	265 X 265 X 306	31.26	1.107	0.553	6~	51.0~60.0	4,768.20
15	LBE-A40C	265 X 265 X 366	38.56	1.476	0.738	8~	68.0~80.0	6,357.60
16	LBE-A48C	265 X 265 X 420	44.40	1.771	0.885	8~	81.6~96.0	7,629.12

※ Intermediate cell configurations are available; Please contact us for custom requirements.

# 05 LBE-PC

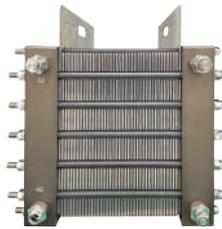


- ▶ LBE-PC Series are PEM type electrolyser stacks configurable up to four parallel assemblies of 1~40 cells, supporting a total of up to 160 cells and a power capacity range of 0.18~80 kilowatts.  
The water used for PEM products is ASTM Type I distilled water.
- ▶ Our high-efficiency membrane technology, developed based on LightBridge's core expertise, reduces system production cost and enables high hydrogen yield per input power.  
This technology features a long life cycle of over 10,000 hours, with an estimated stack lifetime of 20,000 operational hours.
- ▶ Hydrogen produced from the water electrolyser is used as the energy storage medium for HESS (Hydrogen Energy Storage System).  
LightBridge offers electrolysers that can be powered by renewable energy sources such as solar, wind, tidal, geothermal, night-time electricity, and surplus power.  
Hydrogen can be converted back into electricity through a fuel cell when required.

# LBE-PC Series

## LBE-PC Series PEM Standard Stack 1~160 Cell

1~40 Cell per row / 1~4 Column



<Front>



<Side>

**LBE-P40C-L4 [50kW]**

LBE- P   C- L  

Number of Cells per row

Number of Column

Material of Electrode	Membrane	Voltage Range @1.5A/cm <sup>2</sup>	Operating Temperature Range	Electrolytes	Inlet Water Type (ASTM)	Active Area per Cell
Al, Ti	Expanded PTFE-Reinforced Membrane	1.7V~1.8V	40~60°C	-	Type I Distilled Water	100cm <sup>2</sup>

Cell	Model name	Size (mm) (W x H x L)	Weight (kg)	H2 Flow Rate (Nm <sup>3</sup> /h)	O2 Flow Rate (Nm <sup>3</sup> /h)	Electrolyte Circulation flow Rate (LPM)	Applied Voltage Range (V)	Power Capacity (W@1.8V)
1	LBE-P1C	320 X 120 X 55	7.55	0.0627	0.1567	1.5~2	1.7~2.0	270
2	LBE-P2C	320 X 120 X 60	7.90	0.1253	0.1880	1.5~2	3.4~4.0	540
3	LBE-P3C	320 X 120 X 65	8.25	0.1880	0.2194	1.5~2	5.1~6.0	810
4	LBE-P4C	320 X 120 X 70	8.60	0.2507	0.2507	1.5~2	6.8~8.0	1,080
5	LBE-P5C	320 X 120 X 75	8.95	0.3134	0.2820	1.5~2	8.5~10.0	1,350
6	LBE-P6C	320 X 120 X 80	9.30	0.3760	0.3134	1.5~2	10.2~12.0	1,620
7	LBE-P7C	320 X 120 X 85	9.65	0.4387	0.3447	1.5~2	11.9~14.0	1,890
8	LBE-P8C	320 X 120 X 90	10.00	0.5014	0.3760	1.5~2	13.6~16.0	2,160
9	LBE-P9C	320 X 120 X 95	10.35	0.5641	0.4074	1.5~2	15.3~18.0	2,430
10	LBE-P10C	320 X 120 X 100	10.70	0.6267	0.4387	1.5~2	17.0~20.0	2,700
11	LBE-P12C	320 X 120 X 110	11.40	0.7521	0.5014	1.5~2	20.4~24.0	3,240
12	LBE-P14C	320 X 120 X 120	12.10	0.8774	0.5641	3~4	23.8~28.0	3,780
13	LBE-P20C	320 X 120 X 150	14.20	1.2535	0.7521	3~4	34.0~40.0	5,400
14	LBE-P24C	320 X 120 X 170	15.40	1.5042	0.8774	3~4	40.8~48.0	6,480
15	LBE-P28C	320 X 120 X 190	17.00	1.7549	1.0028	5~	47.6~56.0	7,560
16	LBE-P30C	320 X 120 X 200	17.70	1.8802	1.0655	4.5~	51.0~60.0	8,100
17	LBE-P36C	320 X 120 X 230	19.80	2.2562	1.2535	5~	61.2~72.0	9,720
18	LBE-P40C	320 X 120 X 250	21.20	2.5069	1.3788	6~	68.0~80.0	10,800

※ Intermediate cell configurations are available; Please contact us for custom requirements.

# System



- LBEX-AK
- LBEX-PK
- LBEX-MW
- LBEX-PMW

# 06 LBEX-AK



- ▶ LBEX-AK Series are next-generation anion exchange membrane (AEM)-based water electrolysis systems independently developed by LightBridge. The system combines the advantages of low-cost catalysts and alkaline electrolytes, achieving efficient green hydrogen production.
- ▶ While minimizing the use of expensive precious metal catalysts, the system provides high current density and stable operating performance. Its modular design enables scalable configuration from small distributed systems to megawatt-class hydrogen plants. The application of eco-friendly materials and a simplified Balance of Plant(BOP) significantly reduces installation and operational costs.  
LBEX-AK is a next-generation water electrolysis platform capable of supporting projects from decentralized hydrogen production units to utility-scale plants.

# LBEX-AK Series

## AEM Electrolyser System 2.5~5kW Power Consumption



**LBEX- A K**  
 Power Consumption (kW)

Pressure	Operating Temperature Range	Purity of Gas	Electrolytes	Inlet Water Type (ASTM)
MAX 7 barg	10~80℃	Hydrogen gas 99.5~99.9%, Oxygen gas 98%	Alkali Solution (KOH, 30wt%)	Type II or III Distilled Water (≥4 MΩ·cm, ≤0.25 μS/cm)

Power Consumption (kW)	Model name	Size (mm) (L x W x H)	Weight (kg)	H2 Flow rate (Nm3/h)	O2 Flow rate (Nm3/h)	Feed water flow rate(LPM)
2.5	LBEX-A2K	550 X 374 X 580	78.00	0.5	0.25	1.5~2.0
5	LBEX-A5K	1,000 X 550 X 1,200	240.00	1.0	0.5	2.0~2.5

# 07 LBEX-PK



- ▶ LBEX-PK Series are modularized, plug-and-play PEM-type electrolyser systems with a complete Balance of Plant (BOP). This series has a power consumption range of 2~100 kW and a hydrogen production rate of 0.4–20 Nm<sup>3</sup>/h. The water used for PEM products is ASTM Type I distilled water. Each system provides outputs for both H<sub>2</sub> and O<sub>2</sub> gases and includes power input ports for connection to both grid and renewable energy sources.
- ▶ Our high-performance water electrolysis systems are scalable according to power requirements. To construct a 1 MW power plant, ten LBEX-100K units can be connected in parallel.
- ▶ Hydrogen produced from the water electrolyser is used as the energy storage medium for HESS (Hydrogen Energy Storage System). LightBridge offers electrolyzers that can be powered by renewable energy sources such as solar, wind, tidal, geothermal, night-time electricity, and surplus power. Hydrogen can be converted back into electricity through a fuel cell when required.

# LBEX-PK Series

## PEM Electrolyser System 2~100kW Power Consumption



**LBEX-P10K**



**LBEX-P100K**

**LBEX- P K**

Power Consumption (kW)

<2.5kW>

Pressure	Ambient Operating Temperature	Electrolyte Inlet Temperature	Purity of Gas	Inlet Water Type (ASTM)
MAX 5 barg	15~35°C	40~60°C	Hydrogen Gas 99.97~99.99%, Oxygen Gas 99%	Type I Distilled Water Resistivity (18.2MΩ-cm)

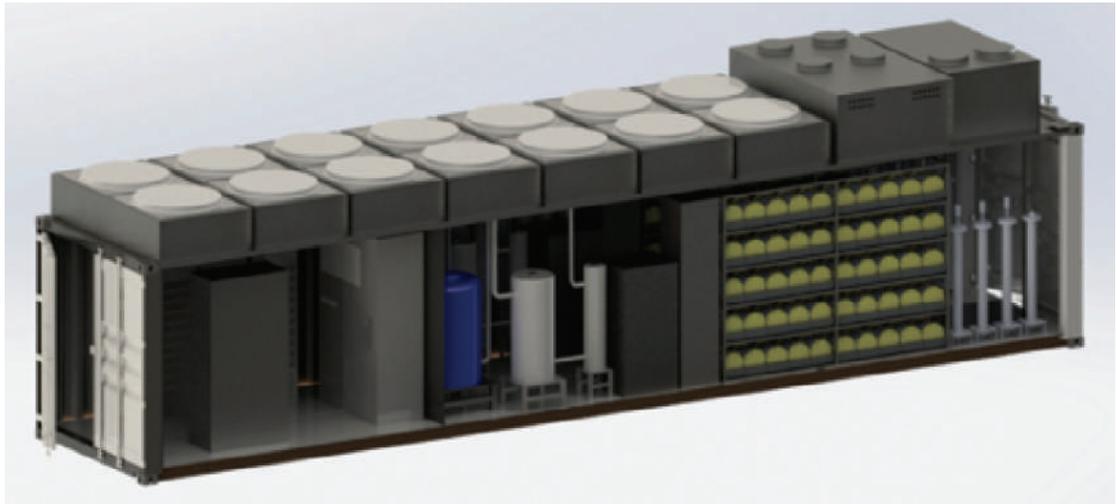
<5-100kW>

Pressure	Ambient Operating Temperature	Electrolyte Inlet Temperature	Purity of Gas	Inlet Water Type (ASTM)
MAX 10barg	15~35°C	40~60°C	Hydrogen Gas 99.97~99.99%, Oxygen Gas 99%	Type I Distilled Water Resistivity (18.2MΩ-cm)

Power Consumption (kW)	Model name	Size (mm) (L x W x H)	Weight (kg)	H2 Flow rate (Nm3/h)	O2 Flow rate (Nm3/h)	Feed water flow rate (LPM)
2.5	LBEX-P2K	550 X 374 X 580	78.00	0.5	0.25	1.5~2.0
5	LBEX-P5K	1,000 X 550 X 1,200	240.00	1.0	0.5	2.0~2.5
10	LBEX-P10K	1,000 X 550 X 1,200	250.00	2.0	1.0	2.0~2.5
20	LBEX-P20K	1,700 X 550 X 1,800	595.00	4.0	2.0	3.0~5.0
30	LBEX-P30K	1,700 X 550 X 1,800	620.00	6.0	3.0	4.5~7.5
40	LBEX-P40K	1,700 X 550 X 1,800	636.00	8.0	4.0	6.0~10.0
50	LBEX-P50K	2,200 X 550 X 1,800	780.00	10.0	5.0	5.0~10.0
60	LBEX-P60K	2,200 X 550 X 1,800	918.00	12.0	6.0	9.0~15.0
70	LBEX-P70K	2,200 X 550 X 1,800	938.00	14.0	7.0	7.0~14.0
80	LBEX-P80K	2,200 X 550 X 1,800	959.00	16.0	8.0	12.0~20.0
90	LBEX-P90K	2,200 X 550 X 1,800	980.00	18.0	9.0	9.0~18.0
100	LBEX-P100K	2,200 X 550 X 1,800	1,000.00	20.0	10.0	15.0~25.0

# 08 LBEX-MW / LBEX-PMW

## 1 Megawatt Unit Concept



- ▶ The LBEX Series represents LightBridge's state-of-the-art modular water electrolysis technology. Each unit is designed as a plug-and-play module that can be easily stacked and expanded, enabling flexible system configuration from kilowatt to megawatt-scale hydrogen plants. Through this modular architecture, the LBEX system maximizes energy storage capacity and economic efficiency of hydrogen production at utility scale. Multiple LBEX units can be connected in parallel to form large-capacity systems while maintaining operational stability and simple scalability.
- ▶ This series is a masterpiece of LightBridge's cutting-edge Alkaline and PEM technology, integrating the advantages of both systems to achieve exceptional performance, durability, and cost efficiency.
- ▶ Hydrogen produced by the LBEX system serves as a core energy carrier for HESS (Hydrogen Energy Storage Systems) and can be powered by renewable energy sources such as solar, wind, tidal, geothermal, and surplus power. With its advanced modular design, the LBEX platform establishes a new standard for next-generation MW-scale green hydrogen plants, combining technical innovation, high efficiency, and long-term reliability.

# 08 Megawatt Class Hydrogen Plant

## LBEX-MW (Using LBE-C Stack)

Power Consumption (MW)	Model name	Size (mm) (L x W x H)	H2 Flow rate (Nm3/h)	O2 Flow rate (Nm3/h)	Electrolyte Circulation flow rate (LPM)
0.5	LBEX-500K	20ft CNTR x1	100.0	50.0	75~100
0.6	LBEX-600K	20ft CNTR x1	120.0	60.0	90~120
0.7	LBEX-700K	20ft CNTR x1	140.0	70.0	75~100
0.8	LBEX-800K	40ft CNTR x1	160.0	80.0	90~120
0.9	LBEX-900K	40ft CNTR x1	180.0	90.0	75~100
1	LBEX-1MW	40ft CNTR x1	200.0	100.0	150~200
1.5	LBEX-1.5MW	40ft CNTR x2	300.0	150.0	225~300
2	LBEX-2MW	40ft CNTR x2	400.0	200.0	300~400
3	LBEX-3MW	40ft CNTR x3	600.0	300.0	450~600
4	LBEX-4MW	40ft CNTR x4	800.0	400.0	600~800
5	LBEX-5MW	40ft CNTR x5	1,000.0	500.0	750~1,000
6	LBEX-6MW	40ft CNTR x6	1,200.0	600.0	900~1,200
7	LBEX-7MW	40ft CNTR x7	1,400.0	700.0	1,050~1,400
8	LBEX-8MW	40ft CNTR x8	1,600.0	800.0	1,200~1,600
9	LBEX-9MW	40ft CNTR x9	1,800.0	900.0	1,350~1,800
10	LBEX-10MW	40ft CNTR x10	2,000.0	1,000.0	1,500~2,000

## LBEX-PMW (Using LBE-PC Stack)

Power Consumption (MW)	Model name	Size (mm) (L x W x H)	H2 Flow rate (Nm3/h)	O2 Flow rate (Nm3/h)	Electrolyte Circulation flow rate (LPM)
0.5	LBEX-P500K	20ft CNTR x1	100.0	50.0	50~100
0.6	LBEX-P600K	20ft CNTR x1	120.0	60.0	60~120
0.7	LBEX-P700K	20ft CNTR x1	140.0	70.0	50~100
0.8	LBEX-P800K	40ft CNTR x1	160.0	80.0	60~120
0.9	LBEX-P900K	40ft CNTR x1	180.0	90.0	60~120
1	LBEX-P1MW	40ft CNTR x1	200.0	100.0	100~200
1.5	LBEX-P1.5MW	40ft CNTR x2	300.0	150.0	150~300
2	LBEX-P2MW	40ft CNTR x2	400.0	200.0	200~400
3	LBEX-P3MW	40ft CNTR x3	600.0	300.0	300~600
4	LBEX-P4MW	40ft CNTR x4	800.0	400.0	400~800
5	LBEX-P5MW	40ft CNTR x5	1,000.0	500.0	500~1,000
6	LBEX-P6MW	40ft CNTR x6	1,200.0	600.0	600~1,200
7	LBEX-P7MW	40ft CNTR x7	1,400.0	700.0	700~1,400
8	LBEX-P8MW	40ft CNTR x8	1,600.0	800.0	800~1,600
9	LBEX-P9MW	40ft CNTR x9	1,800.0	900.0	900~1,800
10	LBEX-P10MW	40ft CNTR x10	2,000.0	1,000.0	1,000~2,000

# 09 Technology of Water Electrolysis System

## Extended Connection Scale-up



**500kW** Water Electrolysis System

Hydrogen Production Rate

100~120Nm<sup>3</sup>/h

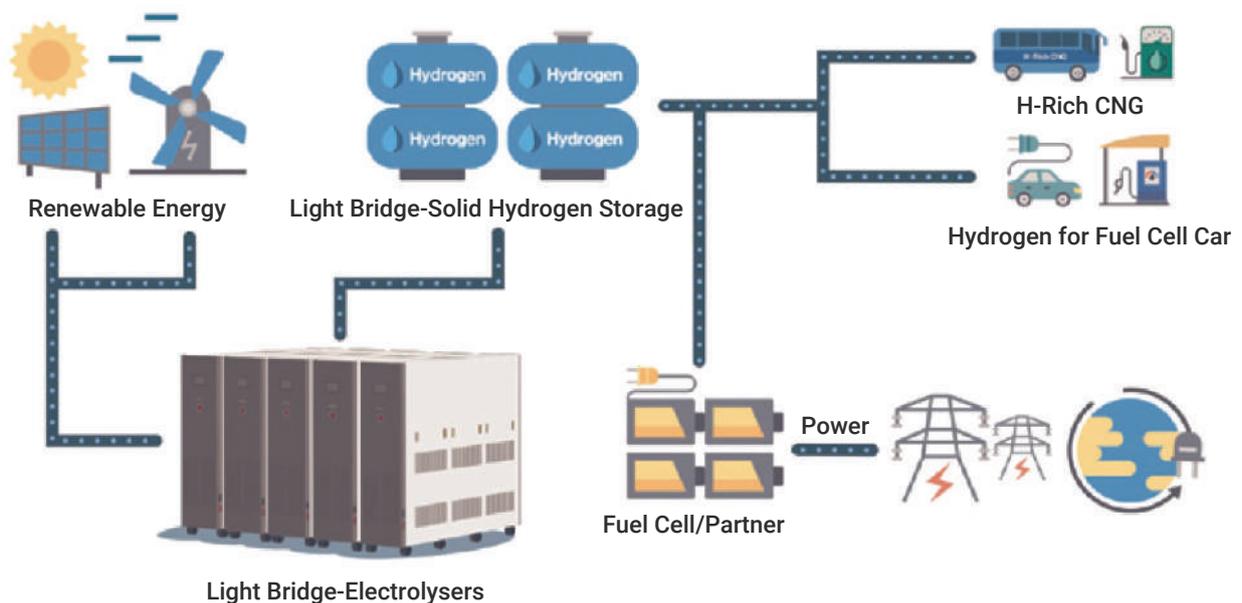


**1MW** Water Electrolysis System

Hydrogen Production Rate

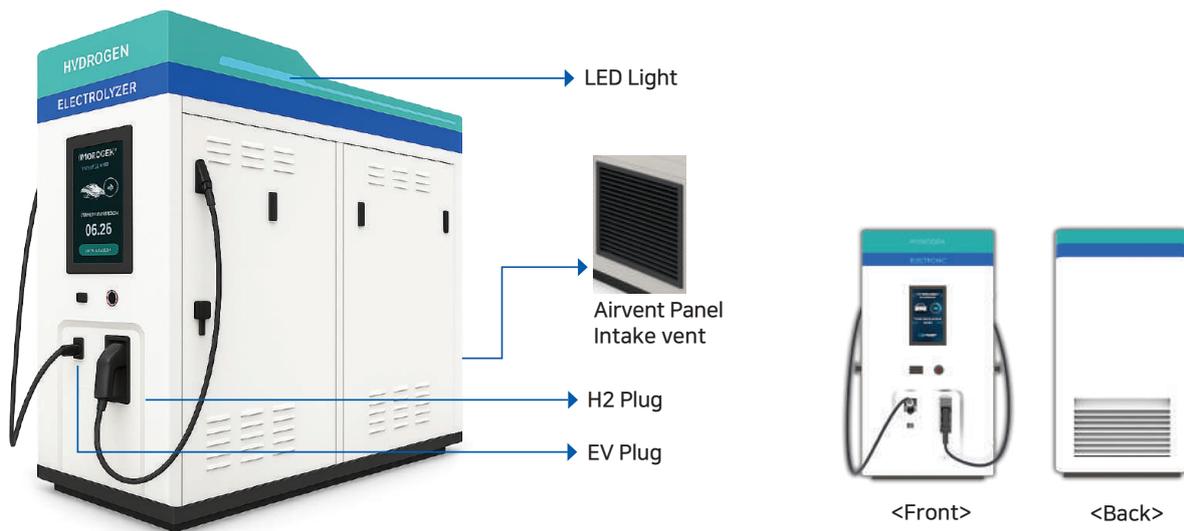
200~240Nm<sup>3</sup>/h

## Hydrogen Energy Capability Matrix



# 10 H-BRIDGE

“Hydrogen + Bridge = A bridge connecting electricity and hydrogen”



H-Bridge is an all-in-one hydrogen energy system that produces hydrogen by electrolyzing water with electricity, purifies and stores it, and supplies it wherever needed. It bridges renewable electricity and clean hydrogen energy through an integrated process of production, purification, storage, and refueling. Through this architecture, H-Bridge serves not only as an ideal solution for companies at the early stages of RE100 adoption, but also as a distributed local energy hub, offering a shared and sustainable energy platform for diverse users. As a Hydrogen Energy Storage System (HESS), H-Bridge compensates for the intermittency of renewable energy by storing excess power in the form of hydrogen. For RE100 companies that require stable, carbon-free power—such as data centers, semiconductor plants, and high-tech manufacturing facilities—H-Bridge provides a next-generation energy infrastructure that ensures efficient and reliable power operation.

## Key Advantages

### Economic Efficiency

Reduces CAPEX and operating costs — up to 75 % smaller footprint and over 50 % labor savings

### Environmental Sustainability

Zero CO<sub>2</sub> and NO<sub>x</sub> emissions. Flexible configuration for both EV and FCEV strategies depending on regional needs.

### Spatial Efficiency

Requires only 10 % of the installation area of conventional hydrogen stations (600 ft<sup>2</sup> → 34 ft<sup>2</sup>).

### Safety

Explosion-proof design compliant with KGS AH271 standards.

### Ease of Installation

Container-type modular structure enables rapid on-site installation.

### Maintenance

Integrated auto-diagnostic and monitoring system for efficient operation.

## Technical Specifications

Size(mm) (L X W X H)	1,800 X 3,200 X 2,400
Hydrogen production	21.6 kg/day
Charging pressure	700 barg
Hydrogen charging speed	1kg/10minutes, (i.e. Hyundai Nexu charging speed 80%/20minutes)
Purity of gas	99.97%
Storage capacity	24kg
Compression method	EHC (Electrochemical Hydrogen Compression)
Electric charging	50kw fast

# 11 H2 Purifier



## Technical Specifications

Gas	Hydrogen
Size(mm) (L X W X H)	1,000 X 550 X 1,200
Input Voltage	380VAC
Power consumption	<5kW
Gas Processing rate	Hydrogen gas 2Nm <sup>3</sup> /h
Adjustable Pressure	Max 10 barg
Purification Method	Catalyst/Absorption.
Inlet Impurities	H <sub>2</sub> O(Dewpoint 10°C)
	O <sub>2</sub> (<1000(ppm))
Outlet Purities	H <sub>2</sub> O(Dewpoint<-100°C)
	O <sub>2</sub> (<1~2(ppm))

## Utility Specification

Section	Size	Type	Flow Rate	Section
Process(In/Out)	3/8"	Male VCR	2N/m <sup>3</sup>	Supplying Gas
Vent	1/4"	Male VCR		Exhaust Gas during Absorption
Sample Gas	1/4"	Male VCR		Analyzing Purified Gas

List	Detail
Processing Method	AUTO Process
Safety Method	Auto blocking, Alarm by Pressure and Temperature
Control System	PLC (LS)
Power Specification	AC380V 3phase Pt Catalyst Column Heater (1ea) - 1kW X 1ea Adsorber Column Heater (2ea) - 1kW X 2ea System - 1kW Total Power - 4kW
Etc	Ethernet, RS-485

# 12 Stack Evaluation Equipment



## LBWS-5K

PEM, AEL, AEM Stack Test Station  
(customisable, power supply: >5kW)



## LBWS-100

PEM, AEL, AEM Stack Test Station  
(customisable, power supply: >100W)

## Technical Specifications for LBWS-5K

Stack Connections	
2-terminal (V+, V-)	
Water & Electrolyte Handling	
Flow Path	All 316 SS
Feed Water Reservoir	1L, 316 SS, auto-water fill
Circulation Pump(electrolyte)	50-400 mL/min, software controlled
Stack Temperature Range	Ambient to 70°C
Purge Gas (N <sub>2</sub> )	PC-controlled MFC on Negative; Manual on Positive
Liquid/Gas Separator/ Dehumidifiers	2 (Negative, Positive), condensers & collection tanks
Data Acquisition	4 Temperature + 6 Analog(e.g., 0-5 V, 4-20 mA)
Product Mass Flow Meters	2 (35 SLM H <sub>2</sub> , 20 SLM O <sub>2</sub> )
In-Line Gas Purity Sensors	H <sub>2</sub> Transmitter for monitoring of H <sub>2</sub> in Product O <sub>2</sub> O <sub>2</sub> Transmitter for monitoring of O <sub>2</sub> in Product H <sub>2</sub>
Pressure sensor	0~10barg 4-20mA

Stack Potentiostat	
Full Scale Current Ranges	100A
Current Resolution	0.1% of range
Voltage Measurement Resolution	10 mV
Sense Lead Input Resistance	1.0 GO
Modes of Operation	Constant, Scan, Step-Stair; V and I

Power Supply	
Maximum Current	100A
Voltage Range	0 - 50 V
Power	Up to 5kW

Physical and Environment	
Operating Temperature	5-35°C
Power Source	220-240VAC, 1 phase
Size (excluding tubing connections)	L800 X W980 X H1570 mm
Weight	120 kg



**Light bridge**  
Green Hydrogen Energy

LightBridge aims to serve as the "Bridge"  
for the future hydrogen community.

**LightBridge Co.,Ltd**

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