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#### PHYLION CHINA

**PHYLION BATTERY CO., LTD. (HEADQUARTER & 1<sup>st</sup> PRODUCTION BASE)**

Add: 181 Jinshajiang Road, New District, Suzhou, Jiangsu, P.R.China 215153

**PHYLION BATTERY (CHUZHOU) CO., LTD. (2<sup>nd</sup> PRODUCTION BASE)**

Add: 689, Shuangcheng Road, Suzhou & chuzhou Modern Industrial Park, Chuzhou, Anhui, P.R. China 239001

Web: [www.phylion.com](http://www.phylion.com)

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#### PHYLION EU

**PHYLION BATTERY (NL) BV.**

Add: Bedrijvenstraat 13, 7641AM Wierden, The Netherlands

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#### PHYLION INDIA

**PHYLION INDIA PVT. LTD.**

Add: 402, 4th Floor, Suncity Arcade, Suncity, Sector-54, Gurgaon Haryana 122002, India

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Mail us: [info.ess@phylion.com](mailto:info.ess@phylion.com)

SE-ESS-V2-2023

# PHYLION BATTERY

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Core Power for Energy Storage System

# ABOUT PHYLION

## Business:

ESS & EV lithium-ion battery development, manufacturing, recycling, etc.

**10.2GWh** Annual Production Capacity  
as of end of 2022

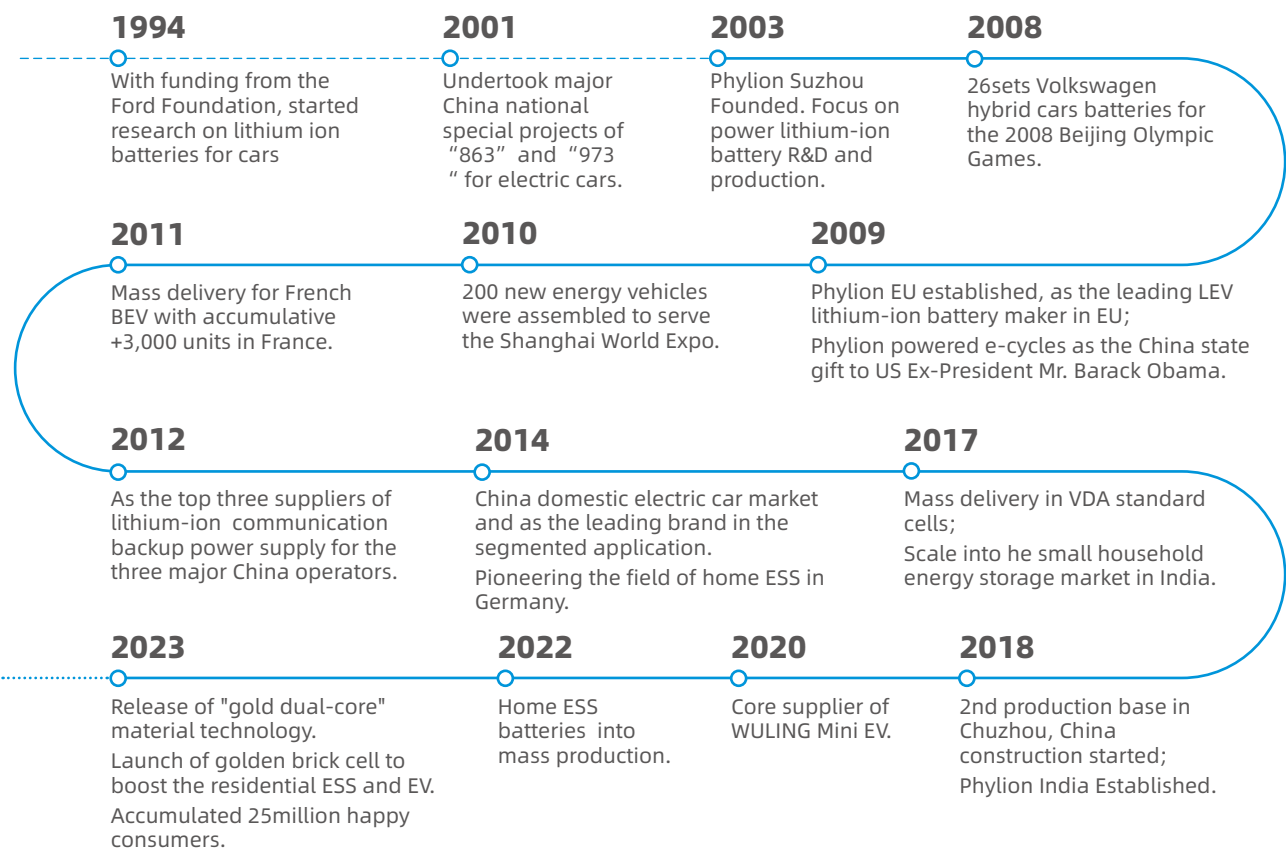
**20Years**  
since 2003

**25 million** Happy Consumers  
including EV/ ESS

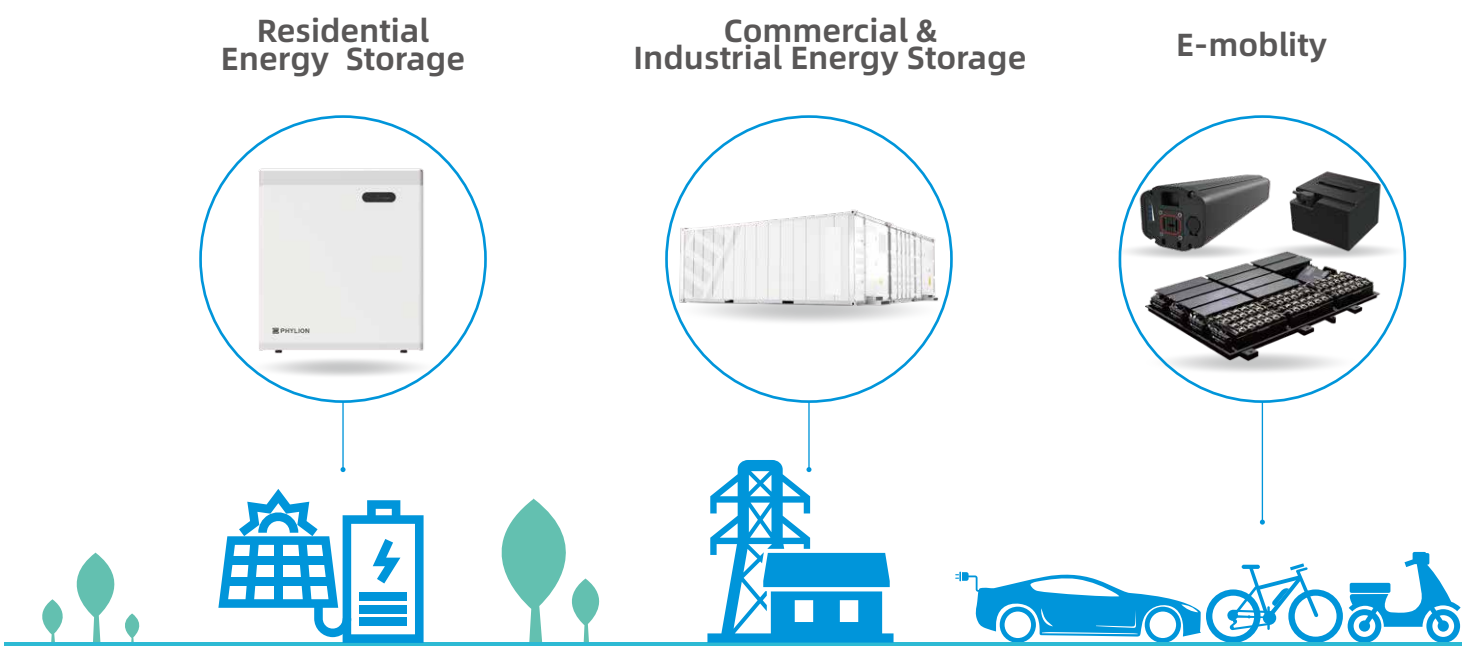
## Highlights:

- **29 Years** from R & D team set up in 1994
- **14 Years** in EU Market from 2009
- **20 Years** in Lithium-ion Cells Production from 2003
- Proper Technical & Service Setup in EU
- BMS & EMS Technical Competence
- Social Responsibility: Closed Business Loop from Raw Materials to Recycling

# MILESTONES



# BUSINESS SCOPE



EV: Battery Electric Vehicle, Electric 3 wheelers, Electric 2 wheelers.

## GLOBAL LAYOUT

CHINA: **20** Years

EU: **14** Years

INDIA: **6** Years



## Overseas Service Network

**EU**

the Netherlands  
/ France/ Italy/UK

**USA**

state of New Mexico

**ASEAN**

Vietnam/ Indonesia  
/ Thailand

## QUALITY SYSTEMS & CERTIFICATIONS

### CERTIFICATIONS



**IATF16949**



### Closed Product Chain

From product to recycling

Cathode materials

Precursor materials  
★ Phylion subsidiary



**Battery recycling**

★ Phylion subsidiary

**Battery sales**

★ Phylion HQ companies

**Battery operation**

★ Phylion subsidiary

**Battery R&D and manufacturing**

★ Phylion HQ companies

### NATIONAL PROJECTS

11 China national "863" EV battery projects, 2 China national "973" projects.

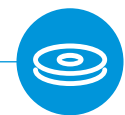


## WHY PHYLION

20 years experience & know-how committed to continuous innovation of lithium-ion battery technology for e-mobility and ESS.

## SAFETY FIRST

Multiple mechanisms on cell design to ensure safety.



### Safety Valve

Developed by Phylion, ensures cells internal pressure released out to avoid extreme if needed.



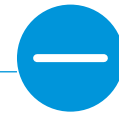
### Structure

High efficient integrated design, only 14 structural components, advanced technology and low manufacturing cost.



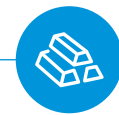
### Tab

Full tab design of the cell ,good overcurrent capability, supports 3C super fast charging; Available to expand to the same side of the tab and terminal, realize CTP and CTC technology, and make PACK more flexible.



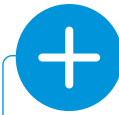
### Anode

Double rivet pressing design, patented micro-tooth copper-aluminum composite structure, stable and easy to process; High precision extrusion and cold drawing process, low cost.



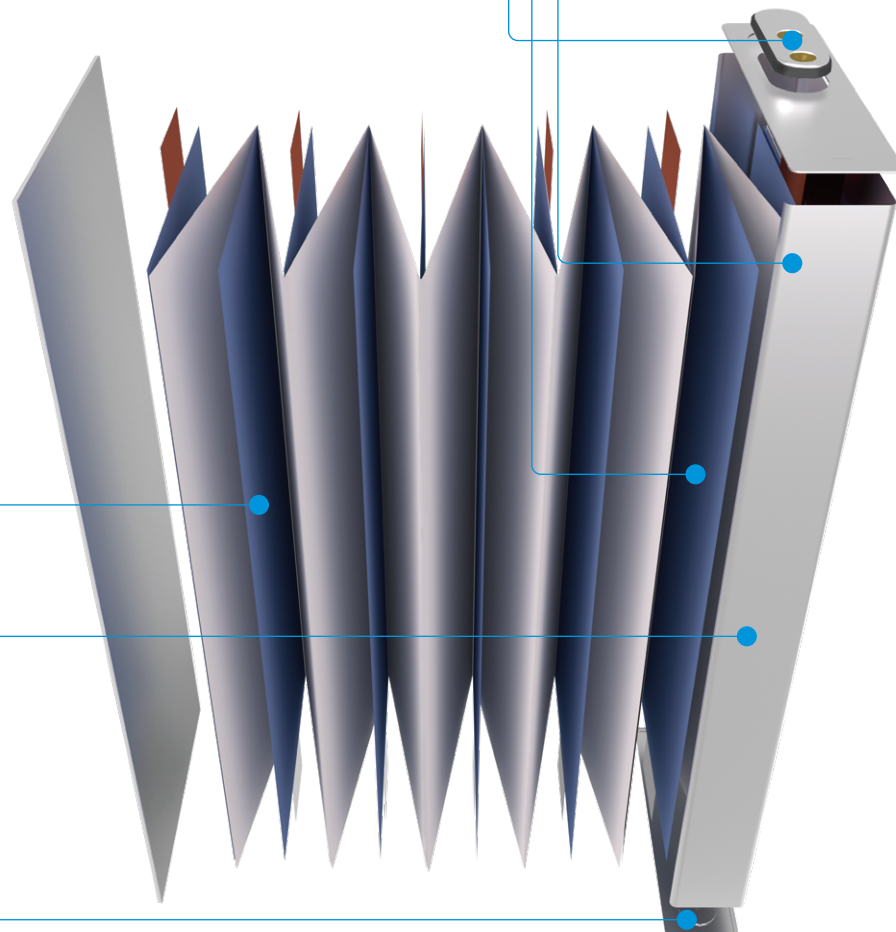
### Materials

Compatible with LFP, LMFP and Sodium.



### Cathode

High efficient integrated design with patented negative pressure sealing structure; Side welding laser sealing process, high welding yield and low laser welding leakage rate.



## Innovative Design LFP

After ten years of continuous research and development, PHYLION has completed the technological innovation of lithium iron batteries. Through advanced material selection and battery structure innovation, it has built a first-class high-energy LFP battery;

Advanced material selection: high-energy lithium iron phosphate, composite artificial graphite, composite conductive additive, low-temperature electrolyte.

## Improvement on Traditional LFP



### Premium Cycle Life

+6000 cycle times



### Excellent high & low temperature performance

Stable operation @-20 °C~50 °C ambient temp



### Excellent anti-attenuation performance

High performance consistence

## Leading in Sodium Battery Industrialization

Long-term deployment, continuous development, first understanding of high performance and better cost performance sodium battery.

3 Core Hightech: High capacity - High-efficiency Anode, Highly efficient dissolvent electrolyte, Design of adding sodium rich solution.

## Equal Performance as Li-ion, but Better Cost.



### Premium Cycle Life

+2000 cycle times,  
2-7 times of lead acid



### Excellent high & low temperature performance

Working temp range as: -40°C ~ 65°C;  
@ 90% remaining capacity @-20°C.



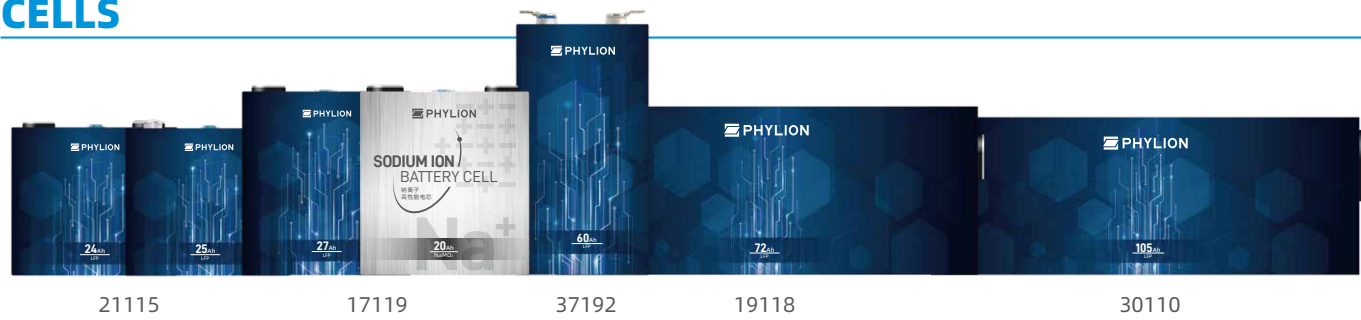
### Better C Rate

2C ch/dischage rate.



# PRODUCT SPECIFICATION

## CELLS



### LFP Cell for E-mobility & Industrial

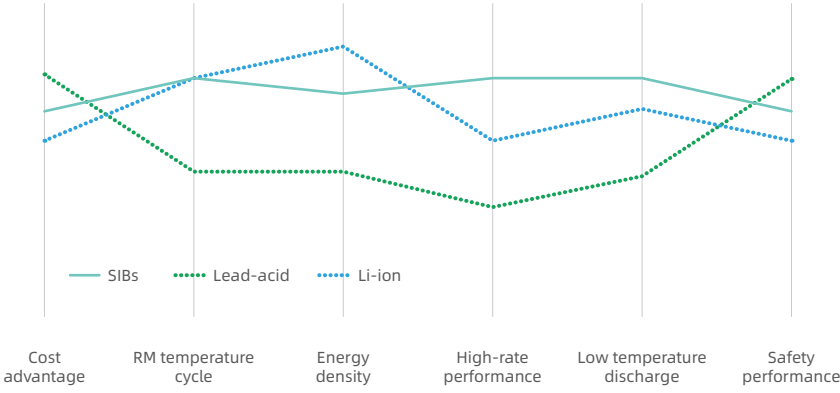
Model No.	IFP21/115/103(24)EA	IFP21/115/105(25)EA	IFP17/119/133(27)EA	IFP37/101/192(60)HA	IFP30/110/300(105)EA
Nominal capacity (Ah)	24	25	27	60	105
Voltage range (V)	2.5~3.7	2.5~3.7	2.5~3.7	2.5~3.7	2.5~3.7
Dimension (T*W*H mm)	21*115*103	21*115*105	17*119*133	37*66*192	30*110*300
Max peak discharge current	3C	3C	3C	3C	3C
Cycle life (1C )	3000	3000	3000	3000	3000
Weight (Approx.)	506g	516g	560g	1350g	2040g
Working Temp	Charge 0°C ~ +55°C Discharge -20°C ~ +60°C				

### LFP Cell for Energy Storage

Model No.	IFP21/115/103(24)EA	IFP21/115/105(25)EA	IFP17/119/133(27)EA	IFP19/118/295(72)EA	IFP30/110/300(105)EA
Nominal capacity (Ah)	24	25	27	72	105
Voltage range (V)	2.5~3.7	2.5~3.7	2.5~3.7	2.5~3.7	2.5~3.7
Dimension (T*W*H mm)	21*115*103	21*115*105	17*119*133	19*118*295	30*110*300
Max peak discharge current	1C	1C	1C	1C	1C
Cycle life (1C )	6000	6000	6000	6000	6000
Weight (Approx.)	506g	516g	560g	1480g	2040g
Working Temp	Charge 0°C ~ +55°C Discharge -20°C ~ +60°C				

### New Lauch- Sodium Cell

Model No.	17119
Nominal capacity (Ah)	20
Voltage range (V)	1.5-3.9
Dimension (T*W*H mm)	17*119*133
Max peak discharge current	2C
Cycle life (1C )	≥2000
Weight (Approx.)	510g
Working Temp	Charge -10°C~+55°C Discharge -30°C~+60°C



## MODULES

Model No.	2P9S (21115)	2P8S (17119)
Cell Model	21115	17119
Dimension(TxWxH mm)	409*152*115	314*123*147
Nominal Voltage	28.8V	25.6V
Nominal Capacity	48Ah	54Ah
Maximum Discharge Current	120A (2.5C)	135A(2.5C)
Working Temp	Charge 0°C~55°C Discharge -20°C~60°C	



2P9S (21115)



2P8S (17119)

Model No.	1P16S (19118)	1P16S (30110)
Cell Model	19118	30110
Dimension(TxWxH mm)	365.5*315*120	539*324.4*114.6
Nominal Voltage	51.2V	51.2V
Nominal Capacity	72Ah	105Ah
Maximum Discharge Current	180A(2.5C)	250A(2.5C)
Working Temp	Charge 0°C~55°C Discharge -20°C~60°C	



1P16S (19118)



1P16S (30110)

Phylion Residential Battery-LV series

RE-L-(5-32)-X01



Model	RE-L-(5-32)-X01					
Nominal Energy(kWh)	5.37	10.74	16.11	21.48	26.85	32.22
Usable Energy (kWh)	4.83	9.67	14.50	19.33	24.17	29.00
Max Cont. Output Power	2.66	5.32	7.98	10.64	13.31	15.97
Peak Output Power(Peak@15s)	5.37	10.75	16.12	21.50	21.50	21.50
Dimension (H, mm)	630(RE-L-5-X01)					
Dimension (W/D, mm)	500*187 (RE-L-5-X01)					
Weight (Kg)	53 (RE-L-5-X01)					
Number of Modules	1	2	3	4	5	6
Nominal Voltage(V)	51.2					
Operating Voltage Range(V)	40-57.6V					
Communication Port	CAN,RS485					
Working Temperature (°C)	0~50					
Shelf Temperature (°C)	-20~60					
Humidity	5%~90%					
Altitude (m)	< 2000					
Expansion	Up to 6 units in parallel					
Enclosure Protection Rating	IP65					
Design Life	15+Years					
Cycle Life	> 6000, @25°C DOD 90%					
Certification	IEC62619/IEC63056/UL1973/CE/RoHS/UN38.3					
Compatible Inverters	Refer to Configuration List					

Battery Module

Model	RE-L-5-X01
Energy (kWh)	5.37
Nominal Voltage(V)	51.2
Weight(Kg)	53
Cell Capacity (Ah)	105

Phylion Residential Battery-LV series

RE-L-(10-40)-X02



Model	RE-L-(10-40)-X02				
Nominal Energy(kWh)	10.24	15.36	20.48	25.60	40.96
Usable Energy (kWh)	9.22	13.82	18.43	23.04	36.86
Max Cont. Output Power	5.12	7.68	10.24	12.80	20.48
Peak Output Power (Peak@15s)	10.24	15.36	20.48	25.60	40.96
Dimension (H, mm)	418	627	836	1045	1672
Dimension (W/D, mm)	446*480				
Weight(Kg)	90	135	180	225	360
Number of Modules	2	3	4	5	8
Nominal Voltage(V)	51.2				
Operating Voltage Range(V)	40-57.6V				
Communication Port	CAN,RS485				
Working Temperature(°C)	0~50				
Shelf Temperature(°C)	-20~60				
Humidity	5%~90%				
Altitude (m)	< 2000				
Expansion	Up to 8 units in parallel				
Enclosure Protection Rating	IP65				
Design Life	10+Years				
Cycle Life	> 4000, @25°C DOD 90%				
Certification	IEC62619/IEC63056/CE/RoHS/UN38.3				
Compatible Inverters	Refer to Configuration List				

Battery Module

Model	RE-L-5-X02
Energy (kWh)	5.12
Nominal Voltage(V)	51.2
Weight(Kg)	53
Cell Capacity (Ah)	100

Phylion Residential Battery-LV series

RE-L-(10-32)-X03



Model	RE-L-(10-32)-X03				
Nominal Energy(kWh)	10.74	16.11	21.48	26.85	32.22
Usable Energy (kWh)	9.67	14.50	19.33	24.17	29.00
Max Cont. Output Power	5.32	7.98	10.64	13.31	15.97
Peak Output Power (Peak@15s)	10.75	16.12	21.50	21.50	21.50
Dimension (H, mm)	710	980	1250	1520	1790
Dimension (W/D, mm)	770*320				
Weight(Kg)	121	174	227	280	333
Number of Modules	2	3	4	5	6
Nominal Voltage(V)	51.2				
Operating Voltage Range(V)	40-57.6V				
Communication Port	CAN, RS485				
Working Temperature(°C)	0~50				
Shelf Temperature(°C)	-20~60				
Humidity	5%~90%				
Altitude (m)	< 2000				
Expansion	Up to 6 units in parallel				
Enclosure Protection Rating	IP65				
Design Life	15+Years				
Cycle Life	> 6000, @25°C DOD 90%				
Certification	IEC62619/IEC63056/CE/RoHS/UN38.3				
Compatible Inverters	Refer to Configuration List				

Battery Module

Model	RE-L-5-X03
Energy (kWh)	5.37
Nominal Voltage(V)	51.2
Weight(Kg)	53
Cell Capacity (Ah)	105

Phylion Residential Battery-HV series

RE-H-(11-27)-X01



Model	RE-H-(11-27)-X01		
Nominal Energy(kWh)	11.05	16.58	22.11
Usable Energy (kWh)	9.95	14.92	19.90
Max Cont. Output Power	5.52	8.29	11.05
Peak Output Power (Peak@15s)	11.05	16.58	22.11
Dimension (H, mm)	1050	1425	1800
Dimension (W/D, mm)	740*165		
Weight(Kg)	125	180	235
Number of Modules	2	3	4
Nominal Voltage(V)	204.8	307.2	409.6
Operating Voltage Range(V)	160-230.4	240-345.5	320-460.8
Communication Port	CAN, RS485		
Working Temperature(°C)	0~50		
Shelf Temperature(°C)	-20~60		
Humidity	5%~90%		
Altitude (m)	< 2000		
Expansion	Up to 5 units in series		
Enclosure Protection Rating	IP65		
Design Life	15+Years		
Cycle Life	> 6000, @25°C DOD 90%		
Certification	IEC62619/IEC63056/VDE2510-50/CE/RoHS/UN38.3		
Compatible Inverters	Refer to Configuration List		

Battery Module

Model	RE-H-5-X01
Energy (kWh)	5.52
Nominal Voltage(V)	102.4
Weight(Kg)	55
Cell Capacity(Ah)	27

Phylion Residential Battery-HV series

RE-H-(7.5-20)-H01



Model	RE-H-(7.5-20)-H01					
Nominal Energy(kWh)	7.48	9.98	12.48	14.97	17.47	19.96
Usable Energy (kWh)	6.73	8.98	11.23	13.47	15.72	17.96
Max Cont. Output Power(kW)	3.74	4.99	6.24	7.48	8.73	9.98
Peak Output Power (Peak@15s,kW)	7.48	9.98	12.48	14.97	17.47	19.96
Dimension (H,mm)	730	900	1070	1240	1410	1580
Dimension (W/D,mm)	606*220					
Weight(Kg)	80	105	129	152.3	176.2	199.5
Number of Modules	3	4	5	6	7	8
Nominal Voltage(V)	144	192	240	288	336	384
Operating Voltage Range(V)	112.5-162	150-216	187.5-270	225-324	262.5-378	300-432
Communication Port	CAN,RS485					
Working Temperature(°C)	0~50					
Shelf Temperature(°C)	-20~60					
Humidity	5%~90%					
Altitude (m)	< 2000					
Expansion	Up to 8 units in series					
Enclosure Protection Rating	IP65					
Design Life	15+Years					
Cycle Life	> 6000, @25°C DOD 90%					
Certification	IEC62619/IEC63056/CE/RoHS/UN38.3					
Compatible Inverters	Refer to Configuration List					

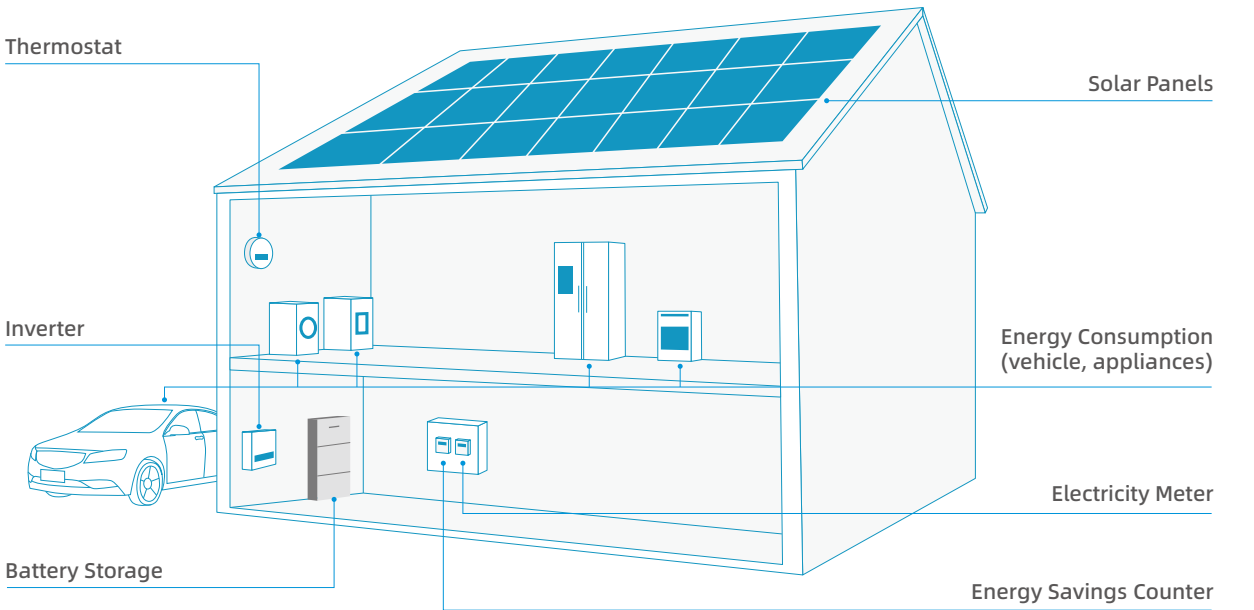
Battery Module

Model	RE-H-2.5-X01
Energy (kWh)	2.49
Nominal Voltage(V)	48
Weight(Kg)	25
Cell Capacity(Ah)	52

PHYLION CLOUD

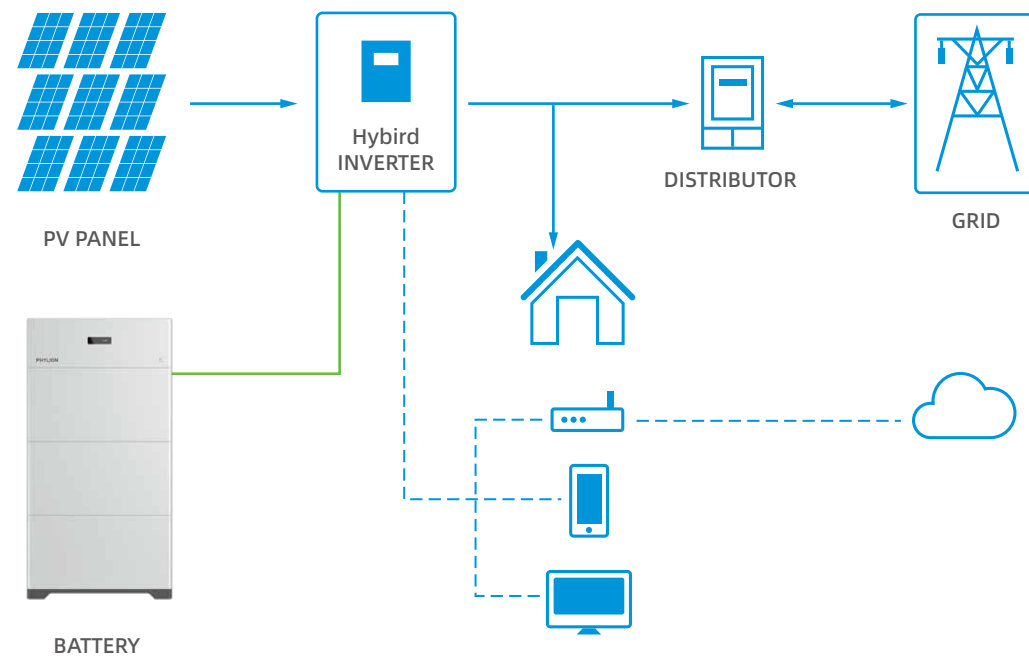


APPLICATION SCENARIO

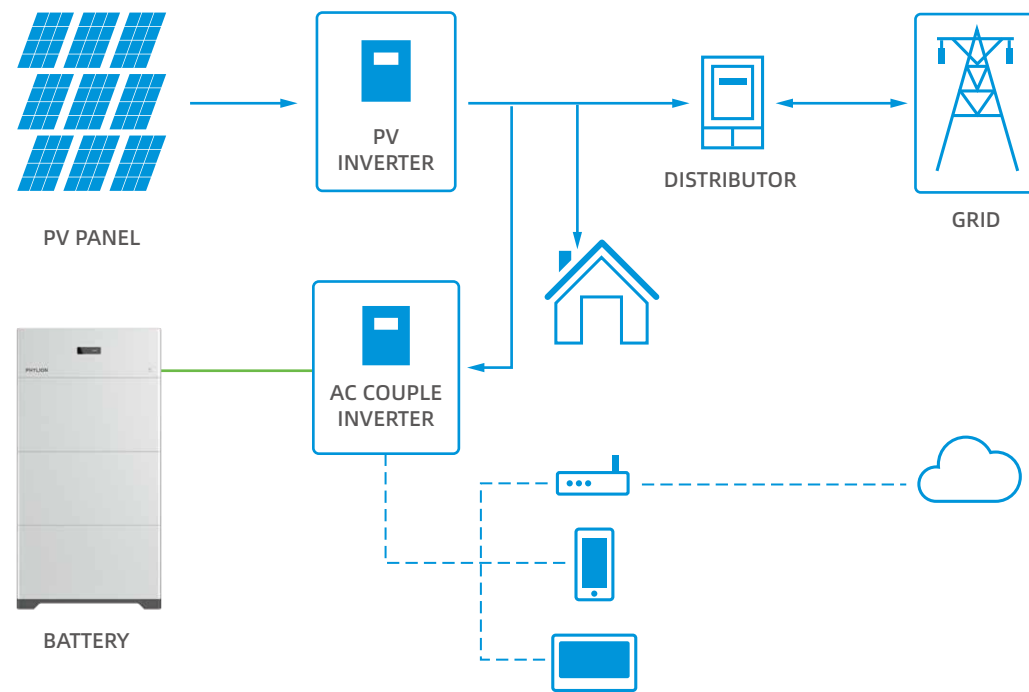




## DC couple



## AC couple



## PHYLION COMMERCIAL & INDUSTRIAL



### Key Features

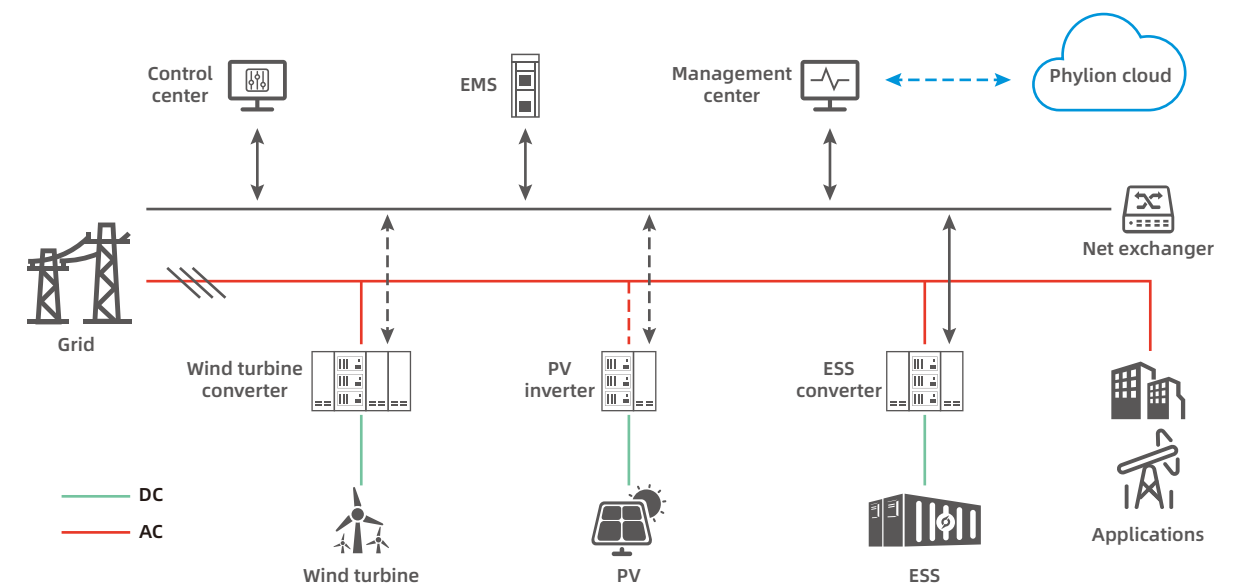
- 1.Simple structure, small space occupied, flexible layout, easy installation, operation and maintenance
- 2.In-Built fire protection, temperature control, and early-warning systems for multiple security guarantees
- 3.Intelligent control system, which can be connected to the local monitoring system
- 4.IP54 protection grade, available for withstanding various climatic environments

### Application

Household side/Utility  
/Industrial Enterprise

Areas lack of power

Islands with no electricity



## Phylion Commerical & Industrial Products

Product Type	50kW/100kwh	100kW/200kwh
DC side Parameter		
Battery Energy ( kWh )	109.4	204.2
Cell Capacity ( Ah )	150	280
BMS Interface/connector type	RJ45/RS485/CAN	
DC Voltage range ( Vdc )	320-850	
Depth of Discharge ( DOD )	90%	
AC side Parameter		
Rated output Power ( kW )	50	100
Max. output Power (kVA)	55	110
Rated output current ( A )	125	250
Max.output current ( A )	150	300
DC Voltage component	<0.5%	<0.5%
Harmony ( THDI )	<3%(Rated output power)	
Rated output Voltage ( Vac )	400	
AC Voltage range ( Vac )	320-460	
Rated output Frequency ( Hz )	50/60	
Frequency range ( Hz )	48-52/58-62	
Power factor	-0.9~+0.9	
AC output wiring system	3W+N+PE	
Topology	Transformerless	
Long-running Power	≤105% ( Off grid )	
runtimes≤10min	105%~110%	
Power ( stop running )	>110%	
General parameter		
System RTE	~90%	
Switching time(ms)	20	
Protect Degree	IP54	
Fire system	Optional: heptafluoropropane/perfluorohexane	
Operating Temperature range ( °C )	30~55	
Relative Humidity	0-95% ( no condensing )	
Dimensions/W*D*H ( mm )	950*1250*2200	1700*1250*2200
Weight ( kg )	≤2000	≤3500
Installation	Outside ,On the Ground	
Noise level(dB)	≤70	
Anti-corrosion grade	C4	
BMS communication protocol	RS485/CAN	
EMS communication protocol	RS485,TCP/IP	
PCS cooling type	Smart Fan Cooling	
Cooling type ( Battery )	Optional: Force-air/Liquid-cooling	
Altitude ( m )	4500 (>3000, derating)	
Cycle number	6000 (0.5C , 90%DOD, RT)	
Lifespan ( year )	10	
Warranty ( year )	10	
Certification	IEC62619/IEC63056/UN38.3/CE/GB36276	

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