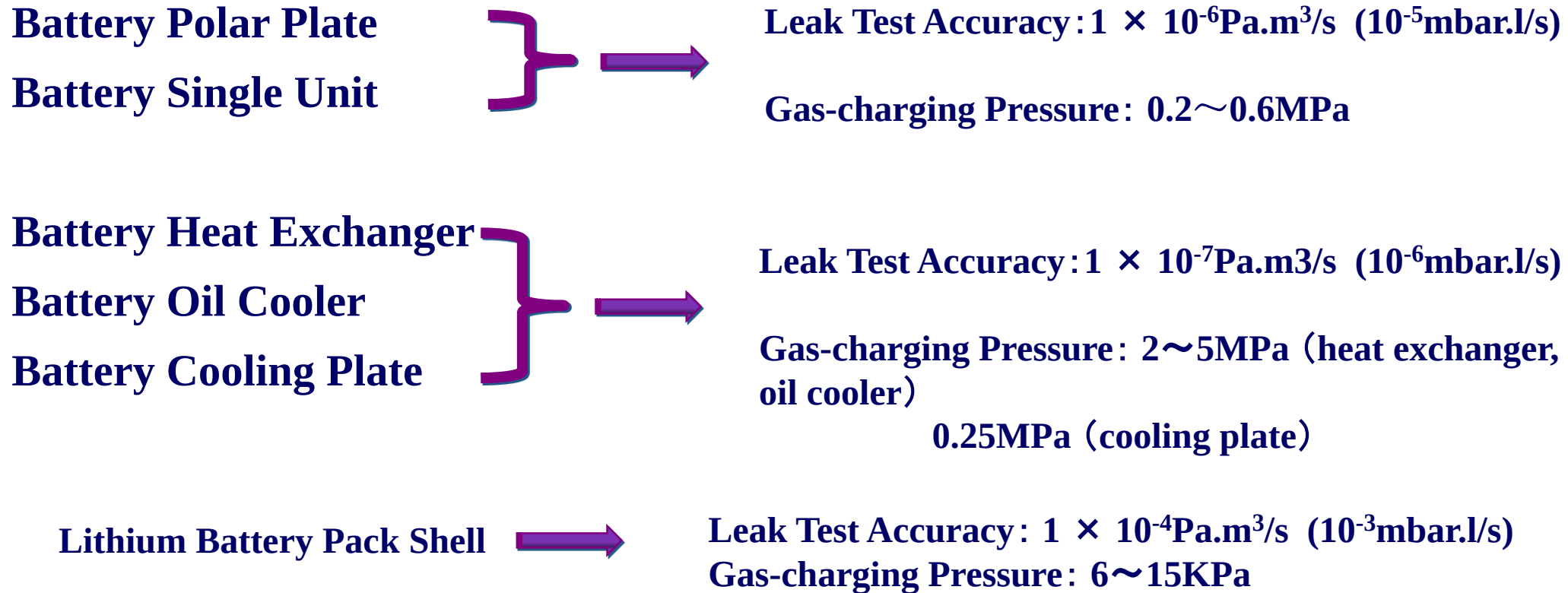


Helium Leak Test Application For Power Battery & New Energy Vehicle Thermal Management

爱发科东方检测技术(成都)有限公司
ULVAC ORIENT TEST AND MEASUREMENT
(CHENGDU) CO., LTD.

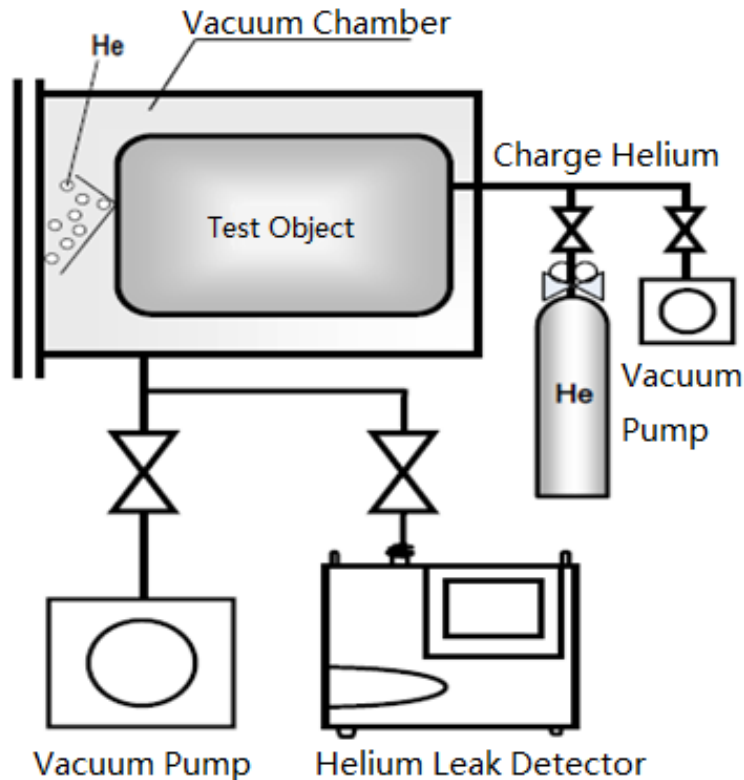


Combined with industry situation, typical leakage control standard is:



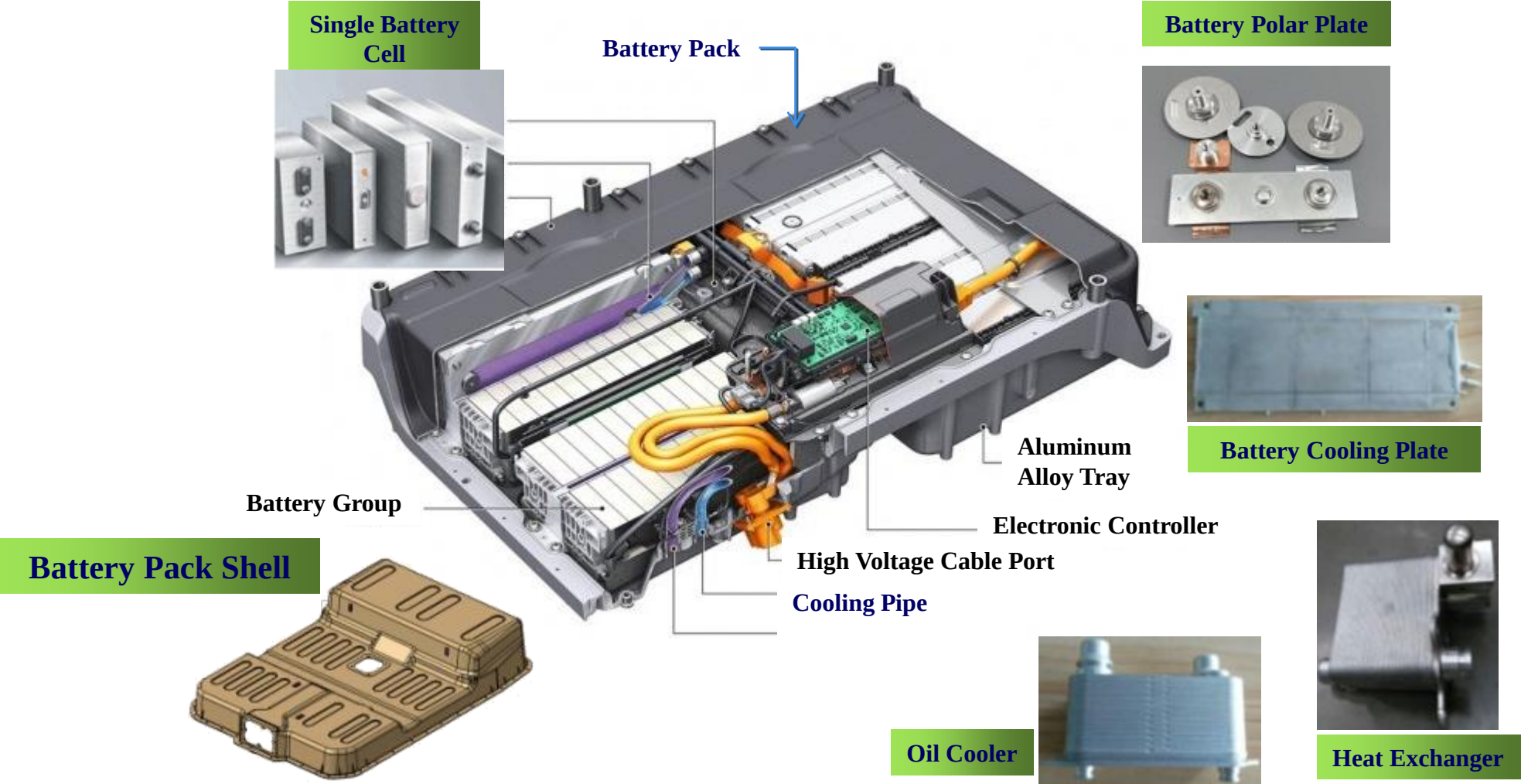
Leak test for power battery requires high accuracy, reliability and efficiency.

Helium leak test is the best choice.



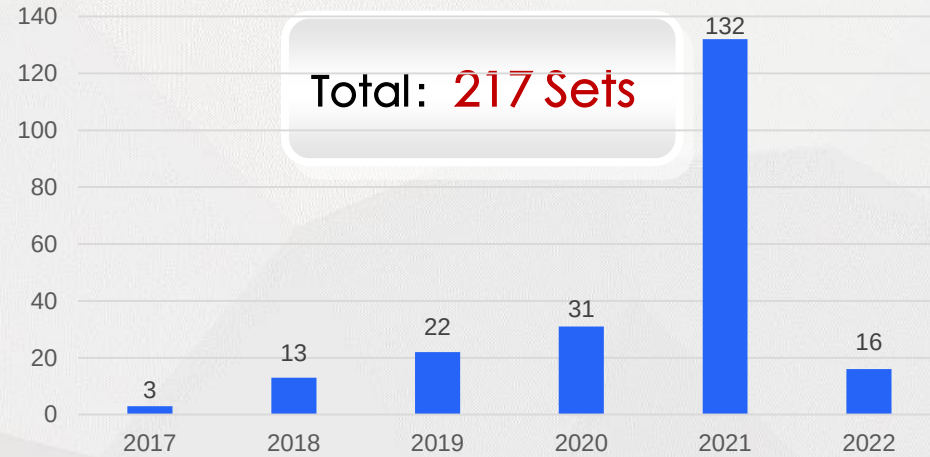
- Helium molecule is tiny, easy to penetrate leak.
- Helium is nontoxic, inflammable, harmless to human and nature.
- Helium is inert gas which does not react with other matter.
- Helium is scarce in atmosphere, only 5PPM, can meet need for high accuracy leak test.
- Vacuum chamber Helium leak test automatically completes without human error.
- Equipped with Helium recovery system, recover and reuse Helium to reduce Helium consumption.

Leak Test Object of Power Battery

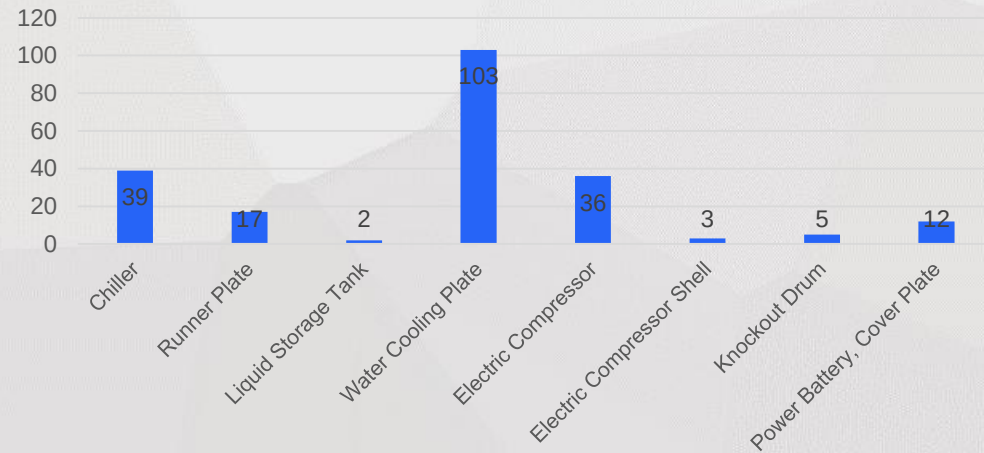


Leak Testing Machines Manufactured by ULVAC Chengdu Supplied to Customers in industries of Power Battery and New Energy Vehicle Thermal Management

1. Sales Performance in latest 5 years



2. Statistics According to Different Types of Work Piece



3. Main Customers

Unit: Set

Customer	Number of Machine Supplied	Work Piece
B**	105	Power Battery, Battery Polar Plate, Straight Cooling Plate, Water Cooling Plate, Electric Compressor, etc.
G**	4	Power Battery
Zhejiang S**	56	Chiller, Runner Plate, Water Cooling Plate, etc.
Ningbo T**	9	Chiller, Runner Plate, Knockout Drum, etc.
Shanghai HS**	3	Electric Compressor
Suzhou S**	1	Electric Compressor
Changchun F**	5	Electric Compressor
Nanjing A**	2	Electric Compressor
Chongqing Y**	3	Electric Compressor Shell
Other	29	Chiller, Runner Plate, Straight Cooling Plate, Water Cooling Plate, Electric Compressor, etc.

Test of Rectangular Battery Core



※ 【Technical Parameters】

Item	Parameter
Working Cycle Time	5sec/pc (12PPM)
He-charging Pressure	0.05~0.3MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s} \sim 1 \times 10^{-7} \text{Pa} \cdot \text{m}^3/\text{s}$

High
Efficiency

High
Accuracy

High
Reliability

Intelligent

NDT

Rectangular Battery Helium Bombing Test



Helium Bombing Leak Testing System for Lithium Battery [Rectangular Power Lithium Battery]

Item	Parameter
Working Cycle Time	4sec/pc
He-charging Pressure	0.3~0.5MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa} \cdot \text{m}^3$

High Efficiency

High Accuracy

High Reliability

Intelligent

NDT

Test of Round-shaped Battery Core



※ 【Technical Parameter】

Item	Parameter
Working Cycle Time	1.3sec/pc (45PPM)
He-charging Pressure	0.05~0.3MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s} \sim 1 \times 10^{-7} \text{Pa} \cdot \text{m}^3/\text{s}$

High
EfficiencyHigh
AccuracyHigh
Reliability

Intelligent

NDT

Power Lithium Battery Polar Plate



※ 【Technical Parameter】

Item	Parameter
Working Cycle Time	2sec/pc (30PPM)
He-charging Pressure	0.15~0.3MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s} \sim 1 \times 10^{-7} \text{Pa} \cdot \text{m}^3/\text{s}$

High
EfficiencyHigh
AccuracyHigh
Reliability

Intelligent

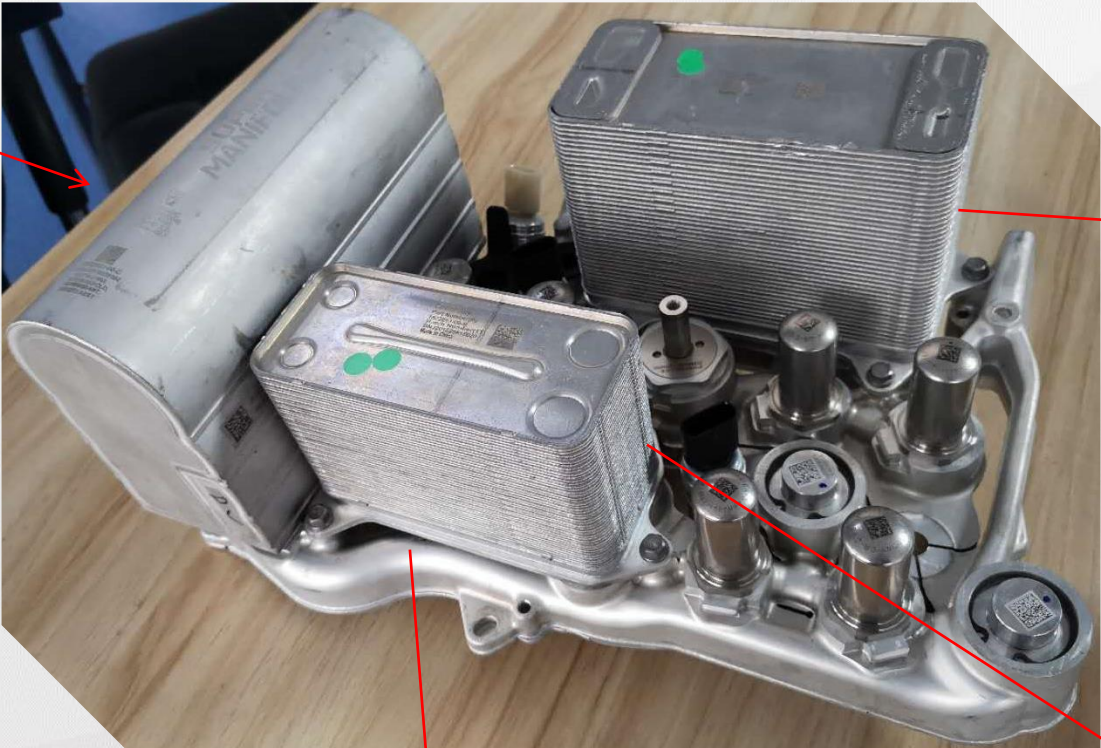
NDT

Application in New Energy Vehicle Thermal Management

Liquid Storage Tank



Battery Cooling Plate



LCC Condenser



CHILLER



Refrigerant Runner Plate



Top Cover for Runner Plate





※ 【Technical Parameter】

Item	Parameter
Working Cycle Time	30sec/pc
He-charging Pressure	3.0 MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa.m}^3/\text{s} \sim 5 \times 10^{-7} \text{Pa.m}^3/\text{s}$

High Accuracy



Intelligent

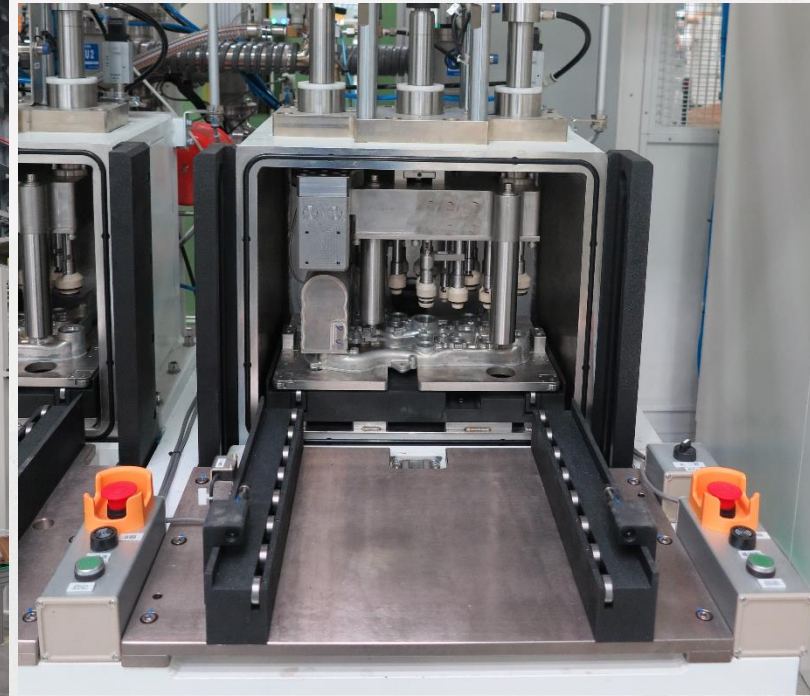


High Reliability



Fully Automatic





※ 【Technical Parameter】

Item	Parameter
Working Cycle Time	30sec/pc
He-charging Pressure	3.0~5.0 MPa
Leak Test Accuracy	$1 \times 10^{-7} \text{Pa} \cdot \text{m}^3/\text{s}$





※ 【Technical Parameter】

Item	Parameter
Working Cycle Time	30sec/pc
He-charging Pressure	0.5 MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa.m}^3/\text{s} \sim 5 \times 10^{-7} \text{Pa.m}^3/\text{s}$

High
Accuracy



Intelligent



High
Reliability



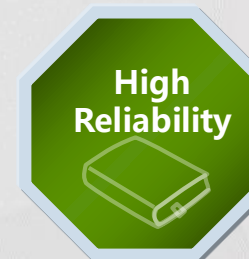
Fully
Automatic



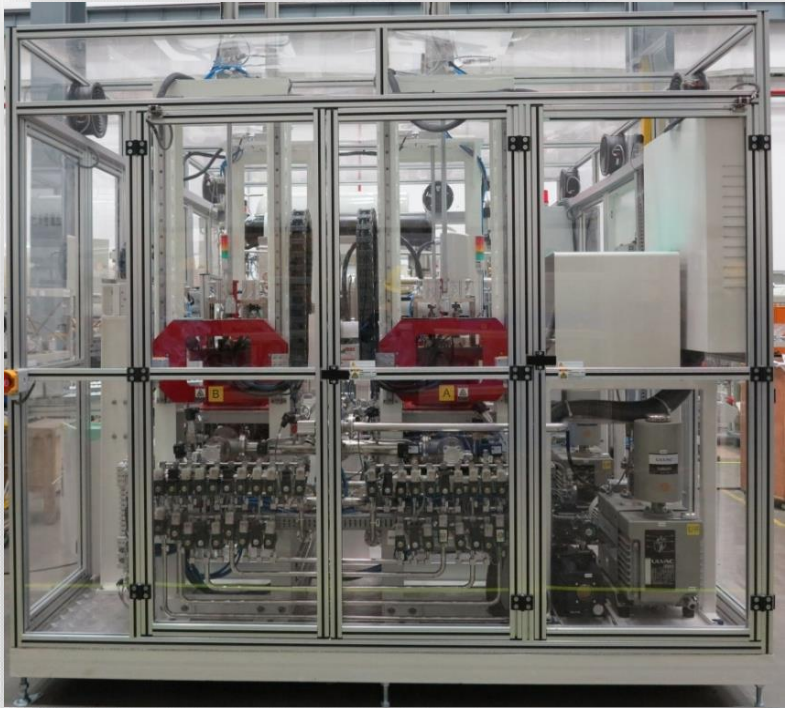


※ 【Technical Parameter】

Item	Parameter
Working Cycle Time	25sec/pc
He-charging Pressure	4.0 MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa.m}^3/\text{s} \sim 5 \times 10^{-7} \text{Pa.m}^3/\text{s}$

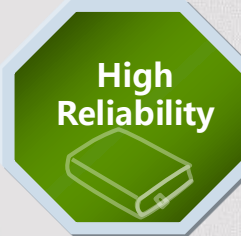


New Energy Vehicle Thermal Management Module —CHILLER



※ 【Technical Parameter】

Item	Parameter
Working Cycle Time	15~20sec/pc (4 chambers work alternately, 80sec/chamber, test inner and outer leak)
He-charging Pressure	Refrigerant Channel: 2.0~8.0 MPa; Water Channel: 0.4~2.0 MPa
Leak Test Accuracy	Refrigerant Channel: $6.0 \times 10^{-7} \text{ Pa} \cdot \text{m}^3/\text{s}$; Water Channel: $1 \times 10^{-4} \text{ Pa} \cdot \text{m}^3/\text{s}$





Item	Parameter
Working Cycle Time	40sec/pc
He-charging Pressure	0.2~0.35 MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa.m}^3/\text{s} \sim 1 \times 10^{-7} \text{Pa.m}^3/\text{s}$

Battery Water Cooling Plate



Item	Parameter
Working Cycle Time	40sec/pc
He-charging Pressure	0.2~0.35 MPa
Leak Test Accuracy	$3.15 \times 10^{-6} \text{Pa.m}^3/\text{s}$

Battery Water Cooling Plate



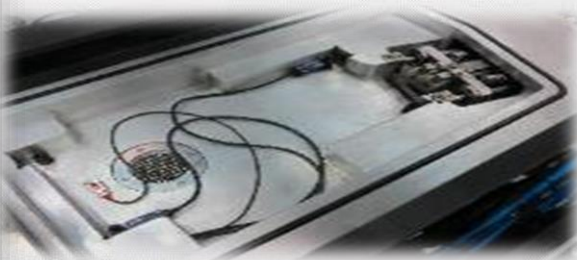
Item	Parameter
Working Cycle Time	15~30sec/pc
He-charging Pressure	0.3MPa
Leak Test Accuracy	$5 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s}$

Battery Water Cooling Plate



Item	Parameter
Working Cycle Time	15~30sec/pc
He-charging Pressure	0.3MPa
Leak Test Accuracy	$5 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s}$

Battery Cooling Plate



Item	Parameter
Working Cycle Time	30sec/pc
He-charging Pressure	0.25 MPa
Leak Test Accuracy	5×10^{-6} Pa.m3/s

Battery Water Cooling Plate



Item	Parameter
Working Cycle Time	40sec/pc
He-charging Pressure	0.3~2.5 MPa
Leak Test Accuracy	$1.0 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s}$

Battery Straight Cooling Plate



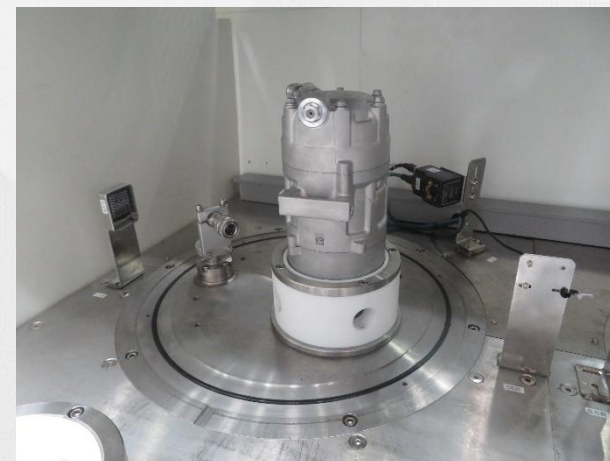
Item	Parameter
Working Cycle Time	60sec/pc
He-charging Pressure	0.3~4.0MPa
Leak Test Accuracy	$1 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s}$

Controller Support



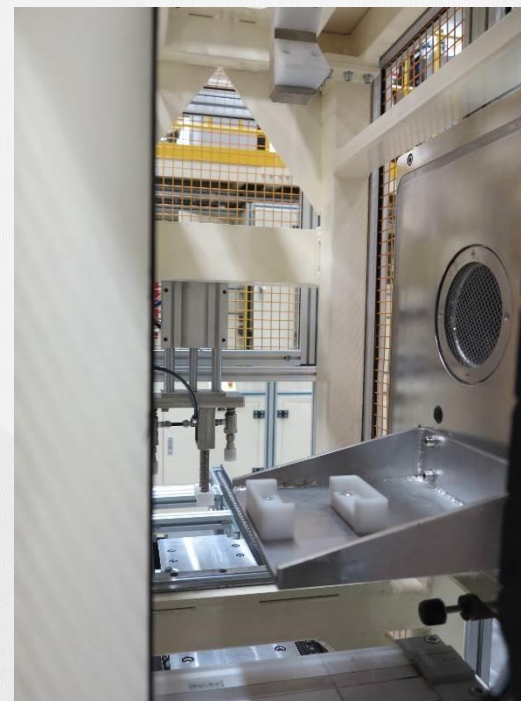
Item	Parameter
Working Cycle Time	45sec/pc
He-charging Pressure	0.2~0.7 MPa
Leak Test Accuracy	$3.3 \times 10^{-4} \text{Pa.m}^3/\text{s}$

Electric Compressor



Item	Parameter
Working Cycle Time	20sec/pc
He-charging Pressure	2.0~3.0 MPa
Leak Test Accuracy	5g/year ($3.0 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s}$)

Electric Compressor

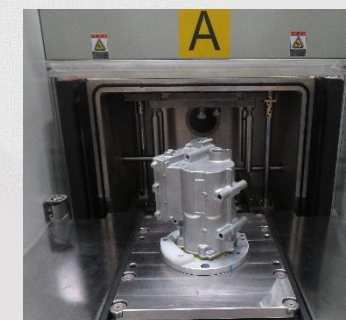


Item	Parameter
Working Cycle Time	20sec/pc
He-charging Pressure	2.0~3.0 MPa
Leak Test Accuracy	5g/year ($3.0 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s}$)

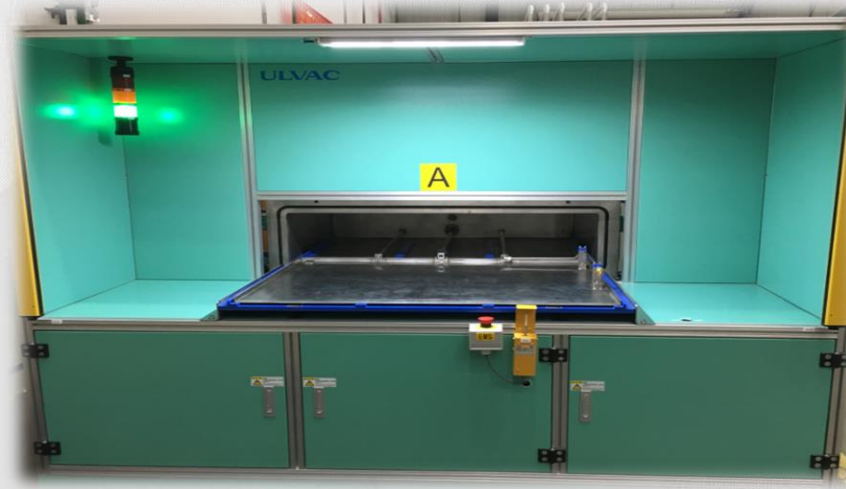
Electric Compressor Shell



Item	Parameter
Working Cycle Time	25sec/pc
He-charging Pressure	2.0~3.0 MPa
Leak Test Accuracy	2g/year ($1.1 \times 10^{-6} \text{Pa} \cdot \text{m}^3/\text{s}$)



Pipe & Other Parts of New Energy Vehicle Thermal Management





Thank you!



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