

WAIN wind power industry applications

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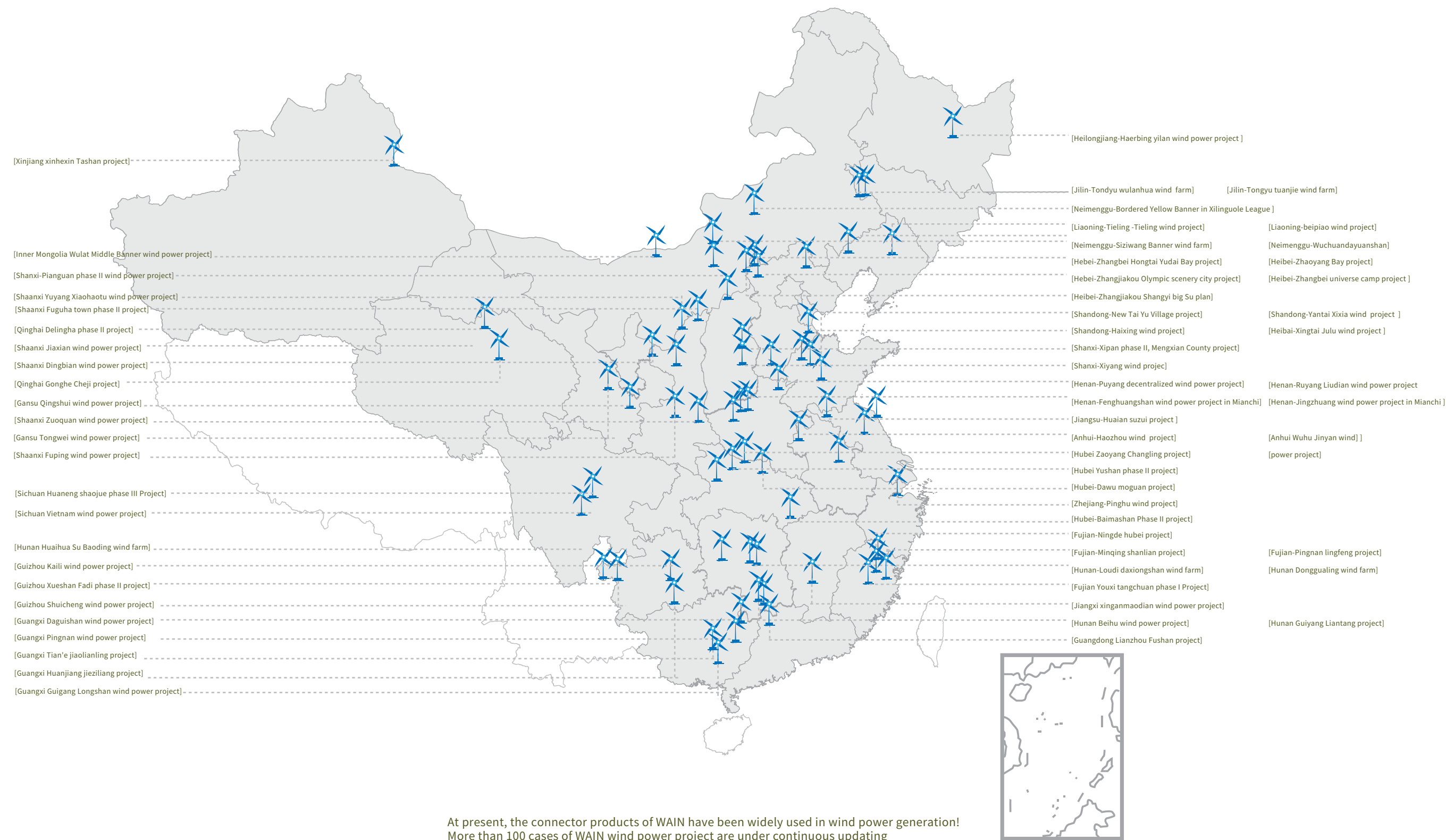
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FOR MODEL SELECTION PLEASE REFER TO THE CATALOG.
TO OBTAIN THE CATALOG PLEASE CALL OUR HOTLINE IN MAINLAND CHINA 400-882-5885, OR
DOWNLOAD THE ELECTRONIC CATALOG ON WAIN WEBSITE.

WAIN WIND POWER INDUSTRY-PERFORMANCE DISTRIBUTION OF DOMESTIC APPLIONS

[PARTIAL PERFORMANCE DISTRIBUTION OF WIND POWER PROJECT]



WAIN PROVIDES SOLUTIONS FOR WIND POWER INDUSTRY

Wain has been focusing on the connector industry and has won the trust of many wind power equipment manufacturers with reliable and proven technology and solutions, becoming their partner. As an excellent supplier of wind power industry, Wayne Wain has been committed to providing customized wind power signal, data and power transmission system for customers for many years. In the wind power industry, Wain mainly provides connecting devices and solutions for pitch control system, electric control cabinet, slip ring, brake, yaw system, converter system, fan communication system, etc. The interaction among many components of the wind farm - generator, gear unit, slip ring and pitch control system is managed by the electrical control cabinet located in the engine room. The products and services provided by Wain can ensure the electrical connection of its components in a safe way and ensure the data communication between components. "The design life of wind farms is at least 20 years, so there are high requirements for the quality and reliability of components. Wain products meet the global technical quality standards and strict environmental safety requirements. The basic standards we have established and the specific requirements of customers will be tested in the witness Laboratory of Wai ul to ensure the long-term safe operation of the products.



WAIN PRODUCT QUALITY TESTING SERVICE

WAIN has been awarded with UL Witness Test Data Program Certificate. It can independently carry out experiments on conventional electrical, material mechanics, surface treatment, environmental protection and mechanical life in the field of connector.

- Professional testing according to international standards;
- Reliable test and verification method;
- Transparent, fair and traceable analytical validation tests and reports;
- Professional UL witness laboratory.

PRODUCT GUARANTEE

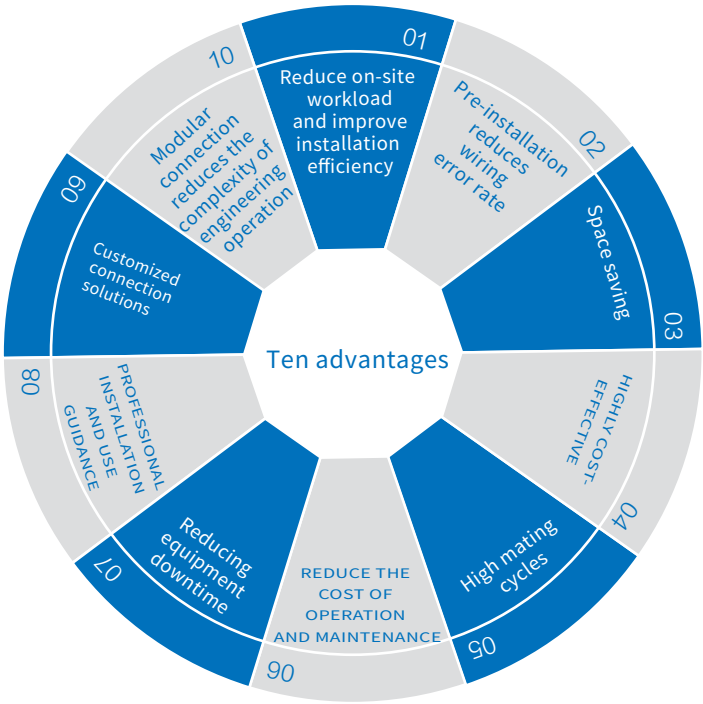
- Management system certification
ISO9001:2015system ISO14001:2015system International railway industry standard: Iris quality management system



- Product guarantee
Global general product certificationc



10 advantages of WAIN wind powerindustry solutions



Reduce on-site workload and improve installation efficiency
Taking 1.5MW fan as an example, there are 20 cables that need field wiring. Based on a single 5-core wire, the traditional wiring method needs nearly 12 hours of wiring time. If the connector can be completed in less than two hours, a lot of installation time can be saved.

The connector wiring is pre installed in the factory, and only simple connection is needed on site. The wiring quality is less affected by the field installation personnel, and can be completed by installing it outside the cabinet, so as to avoid the secondary damage caused by the wiring in the cabinet and the installation environment on site.

Limited by the space in the fan tower, the space utilization rate in the complete cabinet is high, and the device installation is compact. Using connectors to replace outlet terminals can save space in the cabinet and reduce the influence of device layout restrictions in the cabinet.

Compared with terminal blocks, connectors are more expensive. However, the use of connectors can save on-site installation costs and maintenance costs, and reduce the failure rate caused by wiring process. Comprehensive cost performance is high.

The large-scale maintenance of wind turbine requires frequent plug and pull of connectors, and a connector with high insertion connector performance in harsh environments

Reduce the cost of operation and maintenance: for old fans, with the increase of service life and the shortage or inapplicability of spare parts, their reliability will be reduced, which will greatly increase the cost of operation and maintenance. The use of connectors will effectively solve the problems of shortage and inapplicability of spare parts.

Reducing equipment downtime: the great challenges of the supply chain include maintaining various parts of old fans and understanding fans. Once the parts of the fan need to be shut down due to aging and wear, the advantage of pre wiring of the connector will effectively reduce the shutdown time of the fan.

Professional installation and use guidance: introduce advanced wire harness production lines and supporting equipment from abroad, arrange professional engineers to study abroad, and establish Xiamen, Kunshan and Wuhan wire harness branches to provide customers with faster services.

Customized connection solutions: according to the most stringent wire harness system standards in the robot industry, the products are produced with reliable quality. According to the customized needs of customers, our existing products are processed and assembled together through wire harness to form a customized solution for customers' needs, so as to save costs for customers.

Modular connection reduces the complexity of engineering operation: WAIN connector has more than 30 kinds of modules to choose from, flexibly integrating power, signal, pneumatic and Ethernet

Marine application series: rugged metal or composite housing for optimum

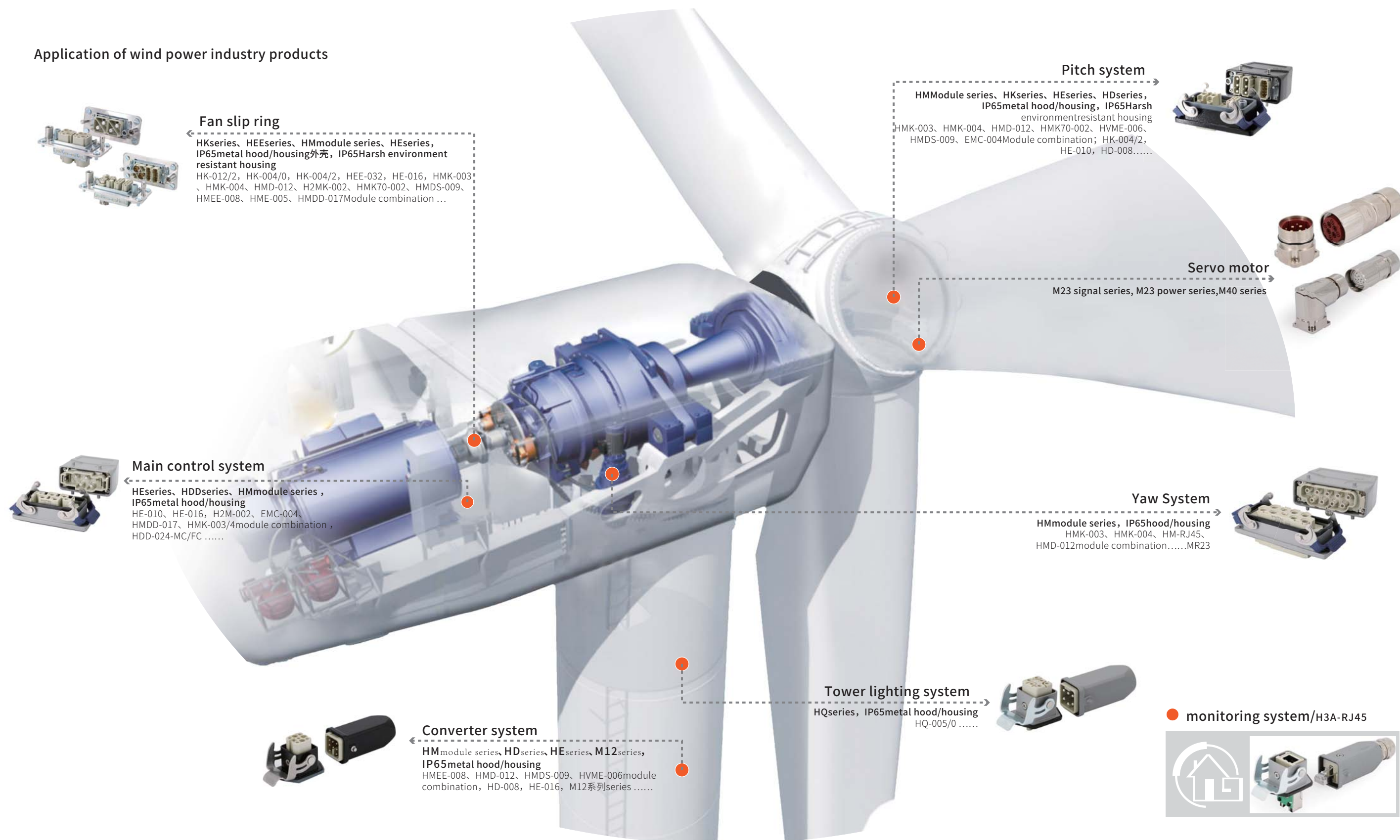
Electromagnetic shielding

High protection

Better corrosion

Excellent sealing

Application of wind power industry products



Wind power industry - popular products



characteristic	technical parameter	Application examples
<ul style="list-style-type: none">· Convenient maintenance· Compact structure, small and light· Can be matched with high protection, EMC or plastic case	<ul style="list-style-type: none">· Rated current: 10-40a· Rated voltage: 230-830v· Number of pins: 2-32· Termination method :screw terminal, crimp connection, spring terminal	<ul style="list-style-type: none">· Tower lighting system· Pitch system



characteristic	technical parameter	Application examples
<ul style="list-style-type: none">· Regular economy· Wide application range· The operation is simple and convenient· Convenient maintenance· It can be matched with IP65 and IP68 enclosure	<ul style="list-style-type: none">· Rated current: 16A· Rated voltage:500V· Number of pins: 6-48· Termination method :screw terminal, crimp connection, spring terminal	<ul style="list-style-type: none">· Control cabinet· Main control system· Fan slip ring· Pitch system



characteristic	technical parameter	Application examples
<ul style="list-style-type: none">· Safe and reliable, easy to maintain· High density crimp contact, up to 216 pins, compact structure· It can be matched IP65 and IP68 hood/housing	<ul style="list-style-type: none">· Rated current: 10a, 16A· Rated voltage: 250-1000v· Number of pins: 7-216· terminal : crimp connection	<ul style="list-style-type: none">· Pitch system· Converter system· Lubrication system



characteristic	technical parameter	Application examples
<ul style="list-style-type: none">· Multi functional module· Compact structure and space saving· The connector can be assembled according to special requirements· The best solution for the present and the future	<ul style="list-style-type: none">· Rated current: 5-200a· Rated voltage: 50-5000v· Number of pins: 1-300· Termination method:screw terminal,crimp connection,spring terminal	<ul style="list-style-type: none">· Fan slip ring· Yaw system· Monitoring system· Converter system· Pitch system

Wind power application products



M23series { M23Power connector
M23Signal connector

characteristic	technical parameter	Application examples
<div>· Mr23 series</div> <div>· Quick and easy installation</div> <div>· Stable housing</div> <div>· Corrosion resistance</div> <div>· High contact density</div> <div>· Outer diameter 26mm</div>	<div>· Rated current: 7a-30a</div> <div>· Rated voltage:60v-630v</div> <div>· Number of pins:· 16-19</div>	<div>· Servo motor</div> <div>· Blade angle encoder</div>



Combination connection | HK combination connector

characteristic	technical parameter	Application examples
<div>· Combining power and signal in one connector</div> <div>· Current connections up to 100A are available</div> <div>· An ideal connector for strong and weak current connection in a narrow space</div>	<div>· Rated current: 10-100A</div> <div>· Rated voltage:160-830V</div> <div>· Number of pins:· 4-42</div>	<div>· Pitch system</div> <div>· Yaw System</div>



High current transmission | HSB High current connector

characteristic	technical parameter	Application examples
<div>· Safe and reliable, easy to maintain</div> <div>· It can be matched IP65 and IP68 hood/housing</div>	<div>· Rated current:35A</div> <div>· Rated voltage:400-690V</div> <div>· Number of contact: 6</div> <div>· Termination: screw terminal</div>	<div>· Pitch speed control system</div>

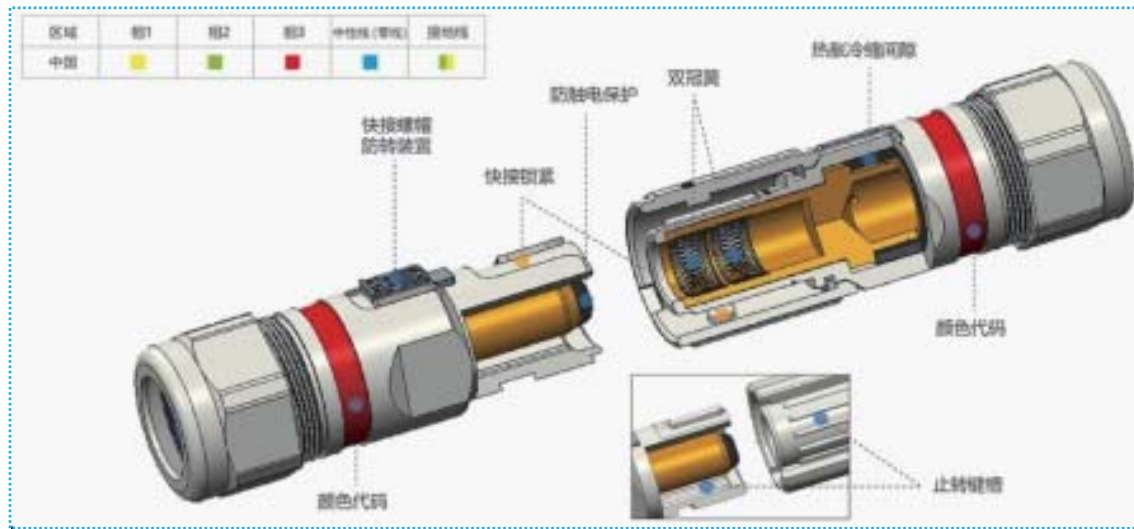


Power connection | M40 power circular connector

characteristic	technical parameter	Application examples
<div>· Excellent corrosion resistance</div> <div>· The structural design of the product is convenient for assembly and disassembly,Convenient for later maintenance</div> <div>· protection degree IP67</div>	<div>· Rated current: 63A 20A</div> <div>· Rated voltage: 630V 250V</div> <div>· Number of contact: 4</div>	<div>· Servo motor</div>

Wain HW series "super" high current cable butt connector

Each component system of a large wind turbine contains a large number of electrical wiring. The traditional hard wiring method can not meet the assembly and disassembly requirements in wind power generation. Wain provides a reliable electrical connection scheme. One of them is a quick plug-in connector for segmented connection of power cable (185-300mm) in tower of megawatt unit customized for wind power customers. The rated current is up to 800A, which is a circular connector with "super" large current that can be used on wind turbines.



Design advantages:

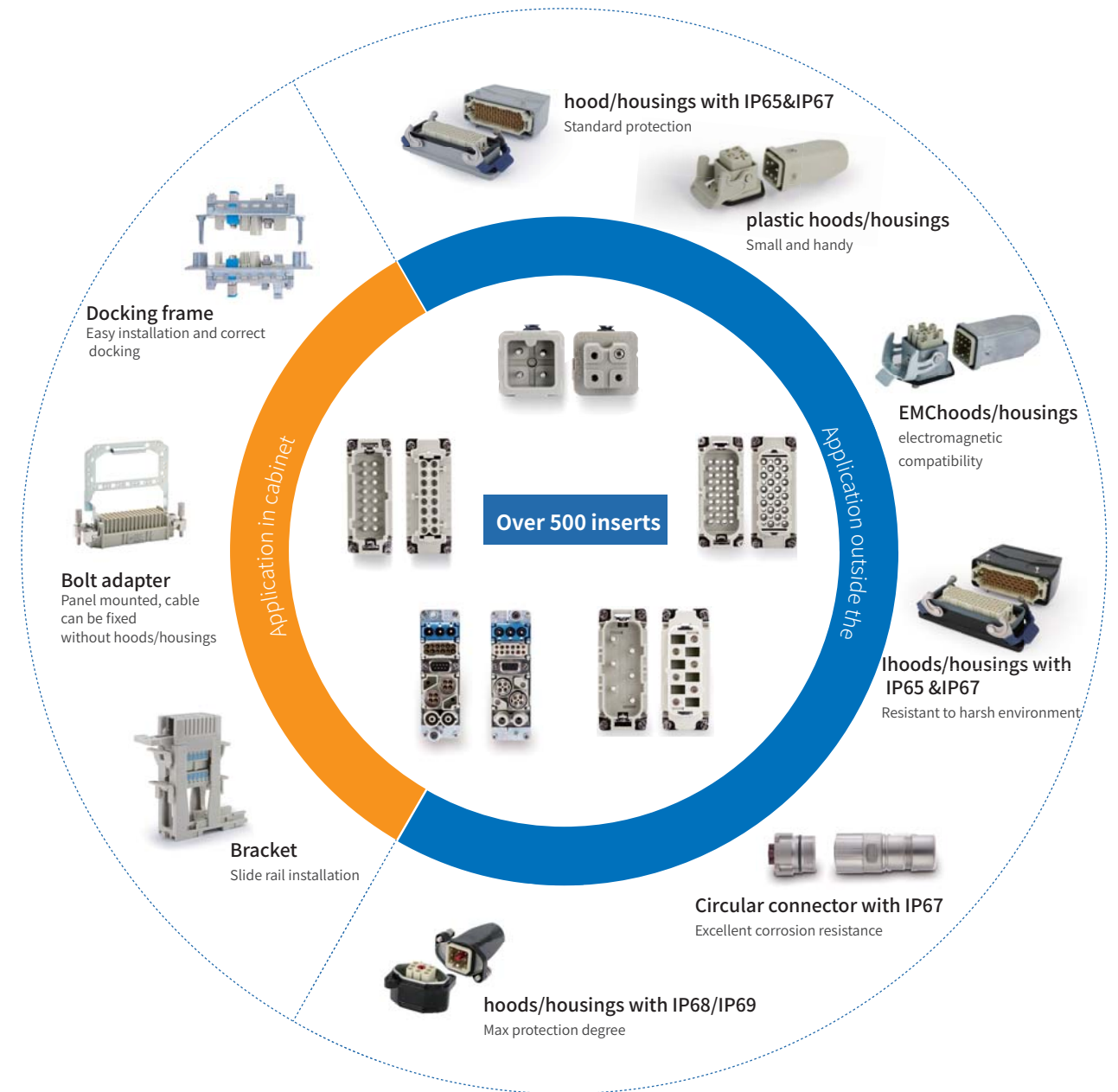
1. The anti rotation device adds a quick connecting nut anti rotation device in the male plug to prevent the nut from loosening and failure.
2. Increase the pin assembly clearance, increase the pin assembly clearance, effectively prevent the damage to the connector caused by thermal expansion and cold contraction.



there are also functions like protection against electric hock, line mark on the pin and color codes.

Effective combination at millions scale

[Thousands of hoods/housings to choose from]



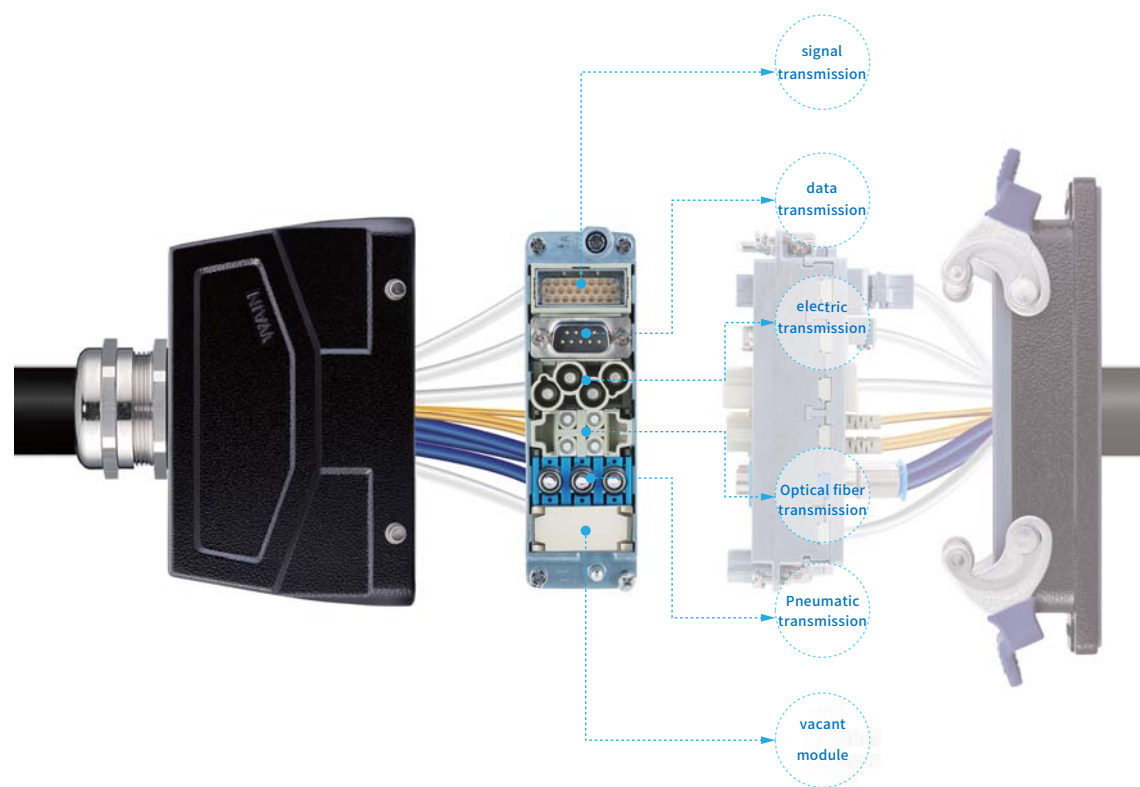
Wind power industry: application advantages of Wain modular connector

Dimension standardization and function modularization

With the increasing demand for various connectors in the market, the shapes and sizes of connectors are also different, and it is difficult to unify them. As far as engineers are concerned, once the connector size selection is confirmed in the design process, once the design requirements are changed or expanded, they will be restricted by the installation space, opening size and other factors. How to realize the flexible modularization of connection function in a standard size space has become a "selection difficulty syndrome" for engineers. For this reason, it helps the engineer select the products easier.

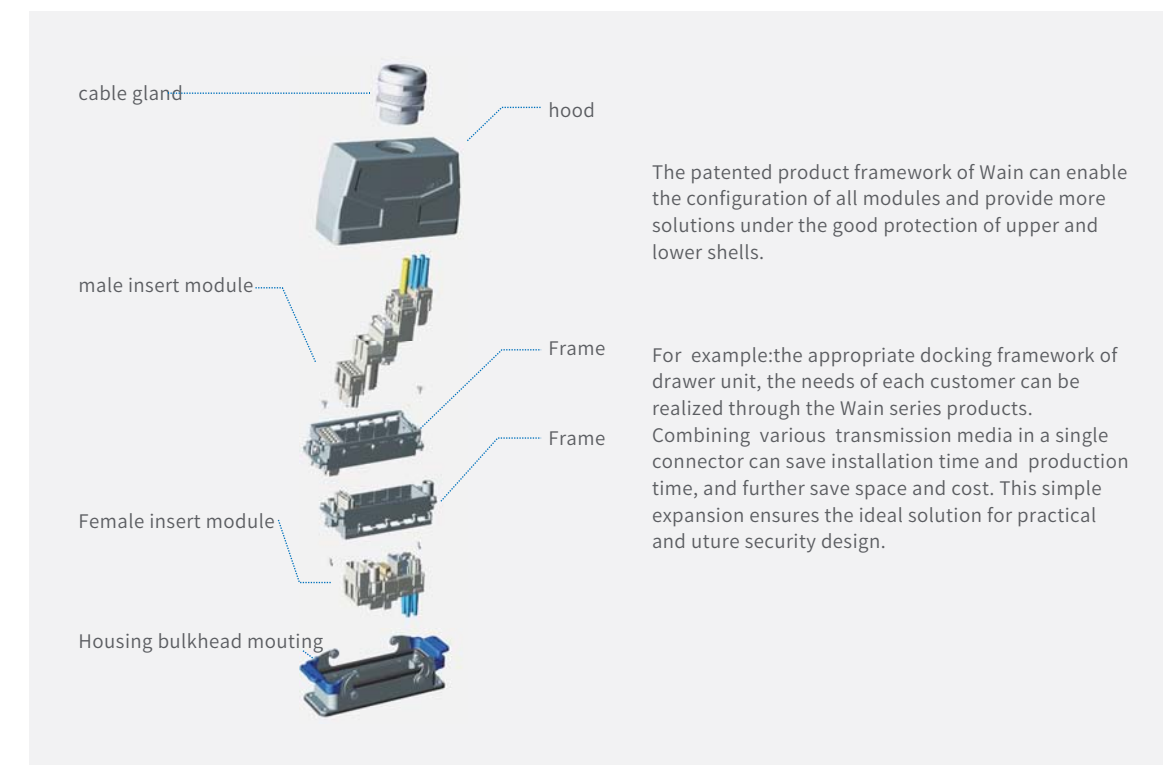
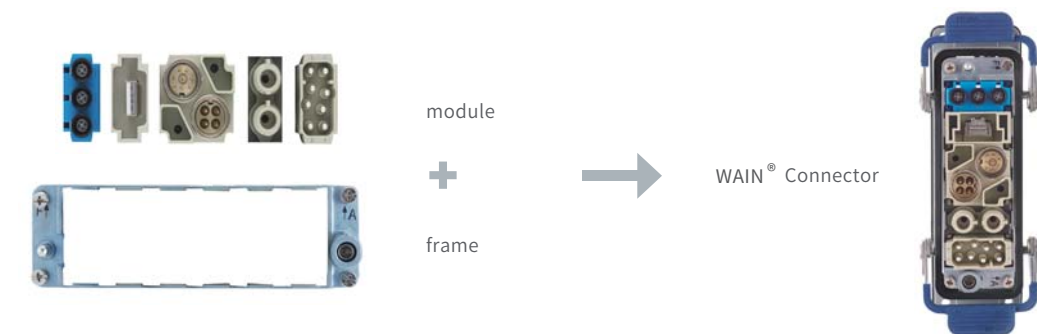
5 advantages of Wain modular connector

- ① Perfect integration of power, signal, optical fiber, fluid connection!
- ② Wiring harness preassembly, fast, professional, reliable, greatly shorten the installation time!
- ③ Standard size, to achieve a variety of transmission at the same time more spacesaving!
- ④ Modular combination type, convenient for customers to integrate multiple signals and effectively save cost!
- ⑤ Reserve the vacant module, in order to adapt to the changes!



Description of Wain module series

Wain's module series products are designed to combine different transmission media in one connector. This multi-faceted system includes inserts, pins, frames, upper and lower shells and accessories to meet the needs of various customers. Customers can choose between more than 30 modules, which can be applied to different transmission media and cover various terminal technologies.



WAIN offshore wind power connector is closely related to environmental characteristics

- Wind energy is one of the most successful energy sources with the least negative impact on the climate. It has become a globally recognized industry, providing a non emission and sustainable form of energy supply. In order to make the equipment run longer and the maintenance time shorter, the connector, as one of the important components of wind turbine, has been applied in the load power side and pitch system control signal terminal, slip ring, control cabinet, braking system, power socket, tower lighting system, etc.
- The main requirements of offshore wind power for connectors are closely related to the application structure and environmental characteristics in this field, including:
 - Vibration resistance, mechanical stress and ambient temperature
 - Prevent seawater, salt fog and other harsh environment
 - High IP protection level for outdoor applications
 - The overall weight of long cable should not be too large



WAIN offshore wind power connector /enclosure series

Wain has a wide range of connectors, which can meet the various connection requirements of the wind power industry and provide reliable and efficient solutions. Due to the long-term operation of offshore wind turbines in high salt fog and high humidity environment, the anticorrosion design of offshore wind turbines should be much higher than that of onshore wind turbines. Under the Wain Housing series, there are M-series shells specially for high corrosion environment and anti vibration series shells. The use environment is the basic basis for reliability design and environment resistance design. The typical application environment of components is vibration, shock, temperature, humidity and salt spray. Taking the salt spray test data as an example, Wain conducts neutral salt spray test on the products according to the standard requirements, and the corrosion-resistance of the products is up to 720 hours, which is the highest standard in the wind power industry.



IP65 high protection degree



Small size space saving



Case corrosion resistance Better performance



IP67 high protection degree



Adhesive free rubber bottom pad, superior anti-corrosion



Case corrosion resistance Better performance



IP68 high protection degree



No exposed gasket seal, excellent sealing performance



Case corrosion resistance Better performance

WAIN Connector-application example

Pitch system example



Electric pitch system



Engine room main control cabinet: using the HE series, HDD series and HM module series of Wain, customers can optimize the design of the interface. Multiple insulators and contacts with the same current and voltage or with different current and voltage can be combined in a single interface. This reduces the number of interfaces required and saves space in the control cabinet.



Slip ring: Wain provides a plug-in design scheme for the slip ring. Through the use of HK, HM and other modular combination series, the data and signals are transmitted to the switch cabinet, and completed in the way of plug-in, which really shortens the installation time, saves space and reduces the cost.

① **Motor:** Wain provides the motor with stable shell, M23, M40 power connection, HR23, MR23 signal connection and other series of circular connectors with corrosion resistance and excellent EMC performance



② **Brake (brake):** according to the working characteristics of the brake, small and light HA or HQ series cold pressure connection can be selected



③ **Encoder:** Wain provides M12, HR23, MR23 and other series of signal connectors with excellent EMC performance to ensure better signal transmission



④ **Limit switch:** different series of HE-006 and HEE-010 can be selected according to different wiring modes



WAIN advantages of customized service

- Introduce advanced wire harness production line and supporting equipment from abroad, and arrange professional engineers to study abroad.
- Wire harness branches in Xiamen, Kunshan and Wuhan to provide customers with faster service.
- Making reliable products according to the most strict requirements of wire harness in robot industry.
- Provide cable assembly service according to the requirements of the customers. Provide customized solutions for the customers.

Customized service



Customized number of outlet of hood



Customized color of hood



Millions of combinations



Fast, flexible and considerate localization service



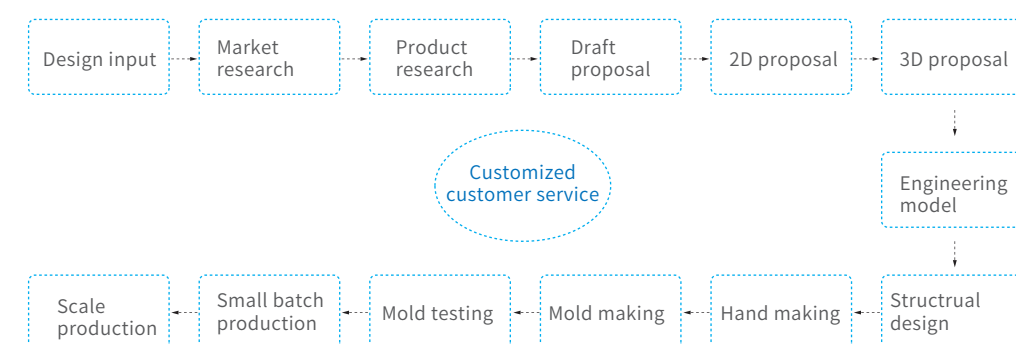
With the rapid development of domestic infrastructure, the delivery period of foreign components is one month, three months or even ery schedule. I often hear the project or purchasing manager complain about the long lead time of foreign products, and sometimes fall into the awkward situation of "calling every day, not calling the land not working".

Wain's fast, flexible and considerate localization service can effectively solve the following problems for customers:

- The capital pressure and inventory risk of long-term preparation due to long delivery period;
- Project stagnation caused by urgent procurement due to technica change or abnormal production;
- Due to the long internal approval process, the procurement material cycle is prolonged, which affects the project delivery time.

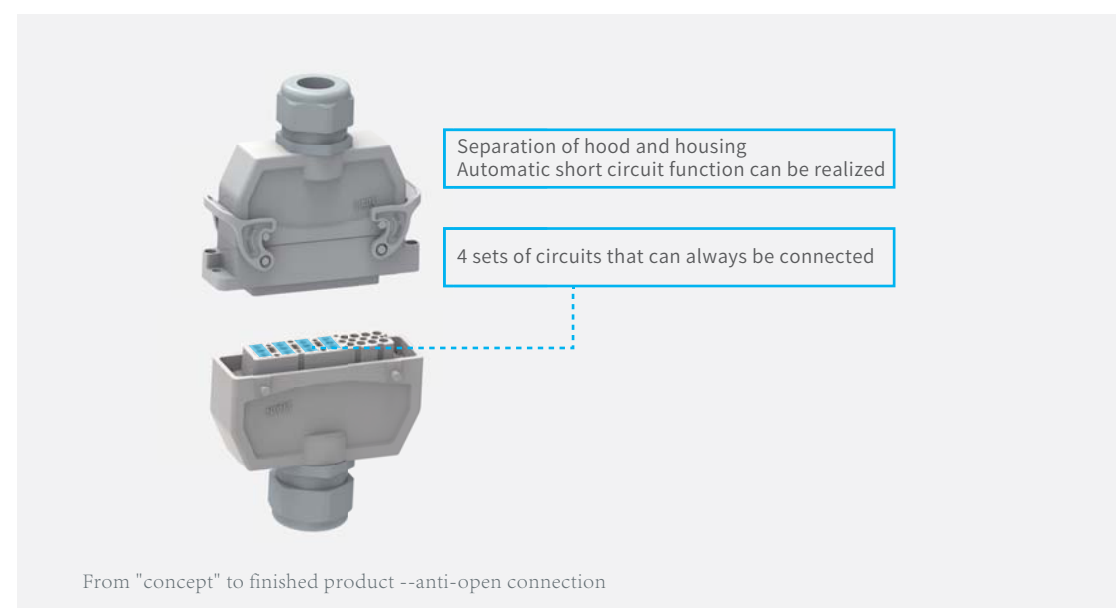
CUSTOMIZED CUSTOMER SERVICE ACCORDING TO CUSTOMER NEEDS

WAIN not only provides industry standard connector solutions, but also provides customers with the best customized solution value-added services. Continuous to create maximum value for customers, so that customers have more unique market competitiveness.



WAIN CUSTOMIZED CONNECTOR SOLUTION

Design support - from concept to finished product
 Communicate and understand customer requirement—3D printing prototype—Test and verify products—Provide sample confirmation and test report—Product batch supply—After-sale service



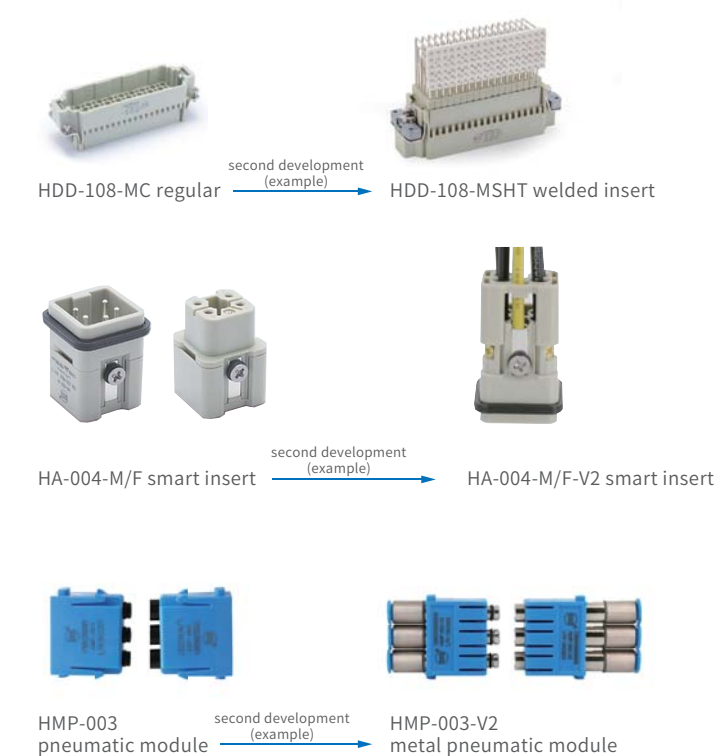
WAIN ASSEMBLING CUSTOM HARNESS SOLUTIONS

WAIN Provide customers with:
 Optimal wiring harness customization solution design service;
 Application experience in industrial infrastructure, wind energy, rail transit, automobile, industrial automation, machinery manufacturing, etc;
 Professional wiring harness assembly services;
 Fast and flexible delivery speed and after-sales service;



WAIN CUSTOMIZED SOLUTIONS FOR PRODUCT SECONDARY DEVELOPMENT

Developing customized solutions for the secondary design on original products through communication with customers.
 WAIN offers:
 Effectively save and control development cost;
 Fast and flexible development process;
 Keep compatibility while optimizing the scheme



DOMESTIC SERVICE POINTS



- Free hotline in Mainland China: 400-882-5885
- WAIN has offices in Beijing, Shanghai, Guangzhou, Shenzhen, Xi'an, Chengdu, Changsha, Hangzhou, Ningbo, Wuhan, Qingdao, Jinan, Suzhou, Yangzhou, Changzhou, Nanjing, Shenyang, Changchun, Dalian and other places, with agents or distributors throughout the industrial cities.
- WAIN has set up wire harness processing plants in Kunshan and Wuhan to provide customers with more convenient and fast wire harness processing services.

WAIN INTERNATIONAL SERVICE POINTS

