



NIETZ

Advanced Oil &
Gas Solution

VFD designed to Control & Protect
Submersible Electric Pump

NIETZ ELECTRIC CO.,LTD

01

Company Introduction

Company Profile | Main Products

Company Introduction

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The NIETZ has won the titles of Shanghai High-tech Enterprise, Shanghai Software Enterprise, Shanghai "Science and Technology Little Giant" Enterprise, and "Shanghai Enterprise Technology Center".

The company focuses on the research and development, production and technical services of electric drive products.

Products are widely used in compressors, textiles, printing, CNC machine tools, fans, water pumps, chemical industry, plastic machinery, woodworking machinery, centrifuges, logistics, mining and other industries.



01

**Electric pump medium voltage
frequency conversion products**

- A, Voltage range: 690V/1300V/2600V**
- B. Current range: 65-105A**
- C, Rectifier structure: 6/12 pulse optional**
- D. Output filtering: sinusoidal filtering**
- E, Scope of application: low cost, energy saving, small footprint**

02

**Electric pump low voltage
frequency conversion products**

- A, Voltage range: 380-480V**
- B. Current range: 160-1600A**
- C, Rectifier structure: 6/12 pulse optional**
- D. Output filtering: integrated sinusoidal filtering**
- E, Application scope: High power, outdoor harsh environment**

03

**Electric pump multilevel
frequency conversion products**

- A, Voltage range: 690-5000V**
- B. Current range: 100-250A**
- C. Rectification structure: 18/24/32 pulse**
- D. Output waveform: sine wave**
- E, scope of application: low harmonic, large displacement pump**

Medium voltage frequency converter for electric pump

Specifications | Features & Advantages | Applications

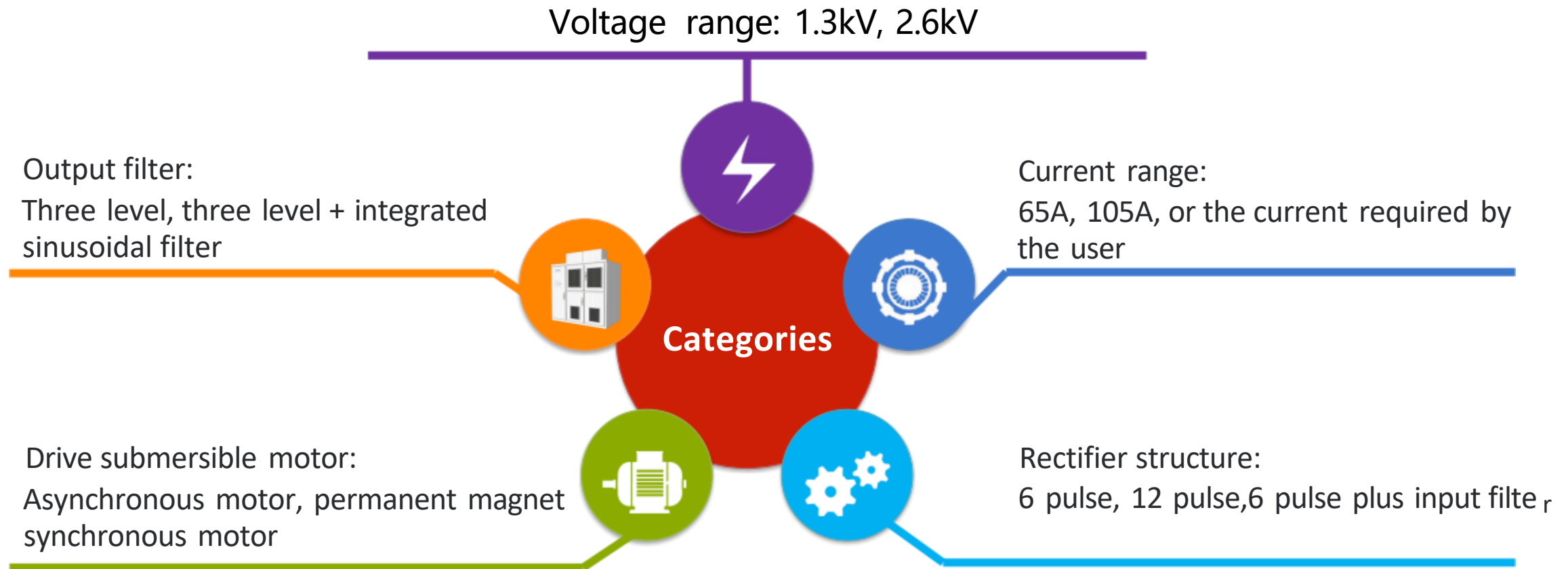


02

Medium Voltage VFD Introduction

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Medium Voltage VFD

Introduction

Specifications | [Features & Advantages](#) | Applications



Product model and main parameters

Type	Input voltage range(V)	Rated output current(A)	Output voltage (Without output filter) (V)	Output voltage (with output filter) (V)*	Maximum output capacity (kVA)	Maximum capacity (output filter) (kVA)
MV-1300-65	700-1300	65	0-1300	0-1270	140	135
MV-1300-105	700-1300	105	0-1300	0-1270	225	218
MV-2600-65	1400-2600	65	0-2600	0-2560	280	273
MV-2600-105	1400-2600	105	0-2600	0-2560	454	440

* With the output sinewave filter, the filter reactance will have 15-30V voltage drop, the actual voltage drop depends on the unit running current.

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Cabinet Dimension (**Integrated output filter**)

Type	Input voltage range(V)	Rated output current(A)	width (mm)	Depth (mm)	Height (mm)	Weight (kg)
MV-1300-65	700-1300	65	900	700	2050	235
MV-1300-105	700-1300	105	900	700	2050	270
MV-2600-65	1400-2600	65	900	700	2050	300
MV-2600-105	1400-2600	105	900	700	2050	335

Cabinet Dimension

Type	Input voltage range(V)	Rated output current(A)	width (mm)	Depth (mm)	Height (mm)	Weight (kg)
MV-1300-65	700-1300	65	700	500	1400	155
MV-1300-105	700-1300	105	700	500	1400	168
MV-2600-65	1400-2600	65	900	800	1900	220
MV-2600-105	1400-2600	105	900	800	1900	235

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Main Technical Parameters

Input power supply voltage range: three-phase 1300VAC (+ 5%-15%), 2600VAC (+ 5%-15%)

Output overload capacity: (150% x rated current), 1 minute

Output frequency range: 0-80Hz

Control mode: Forced V/F

Starting mode: Smooth starting, synchronous starting, torque boost, swing starting, maximum torque starting

Frequency set: Constant frequency, constant current, pump inlet pressure, external analog quantity

Mode selection: Manual/automatic switch

Fault record: Records and stores fault types and related information in the last one year

Protection level: IP20

Cooling method: Forced air cooling



Medium Voltage VFD

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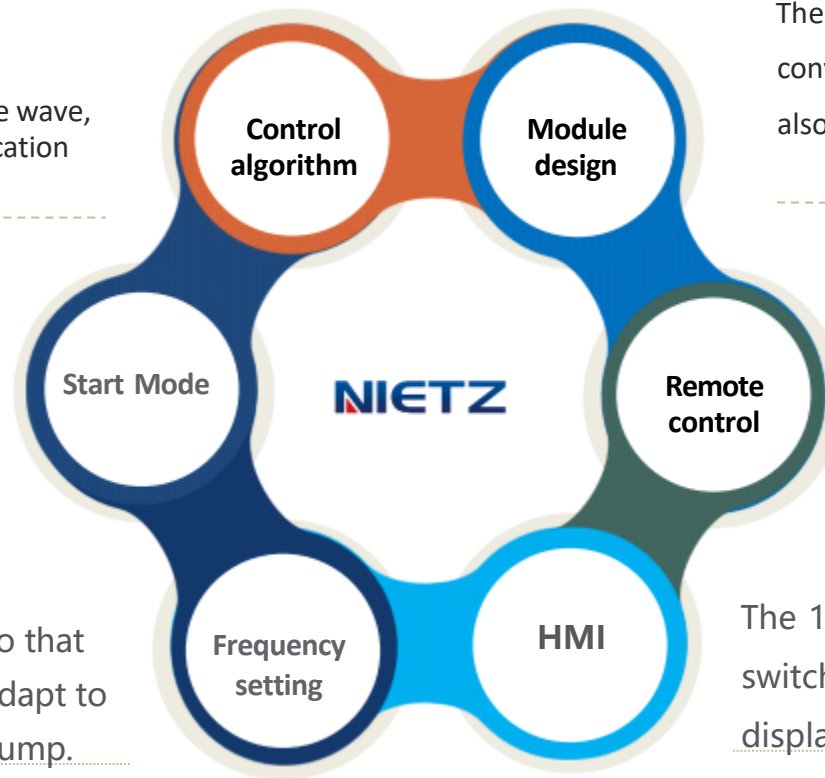
Specifications | Features & Advantages | Applications

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The optimized three-level SVPWM control algorithm is adopted, and the output voltage waveform is quasi-sine wave, which is very suitable for long cable transmission application of electric submersible pump.

Five optional starting modes are provided to solve the starting difficulties of the electric submersible pump when it meets sand jam, heavy oil, scale formation and so on.

Support a variety of frequency setting mode, so that the frequency conversion system can flexibly adapt to different applications of electric submersible pump.



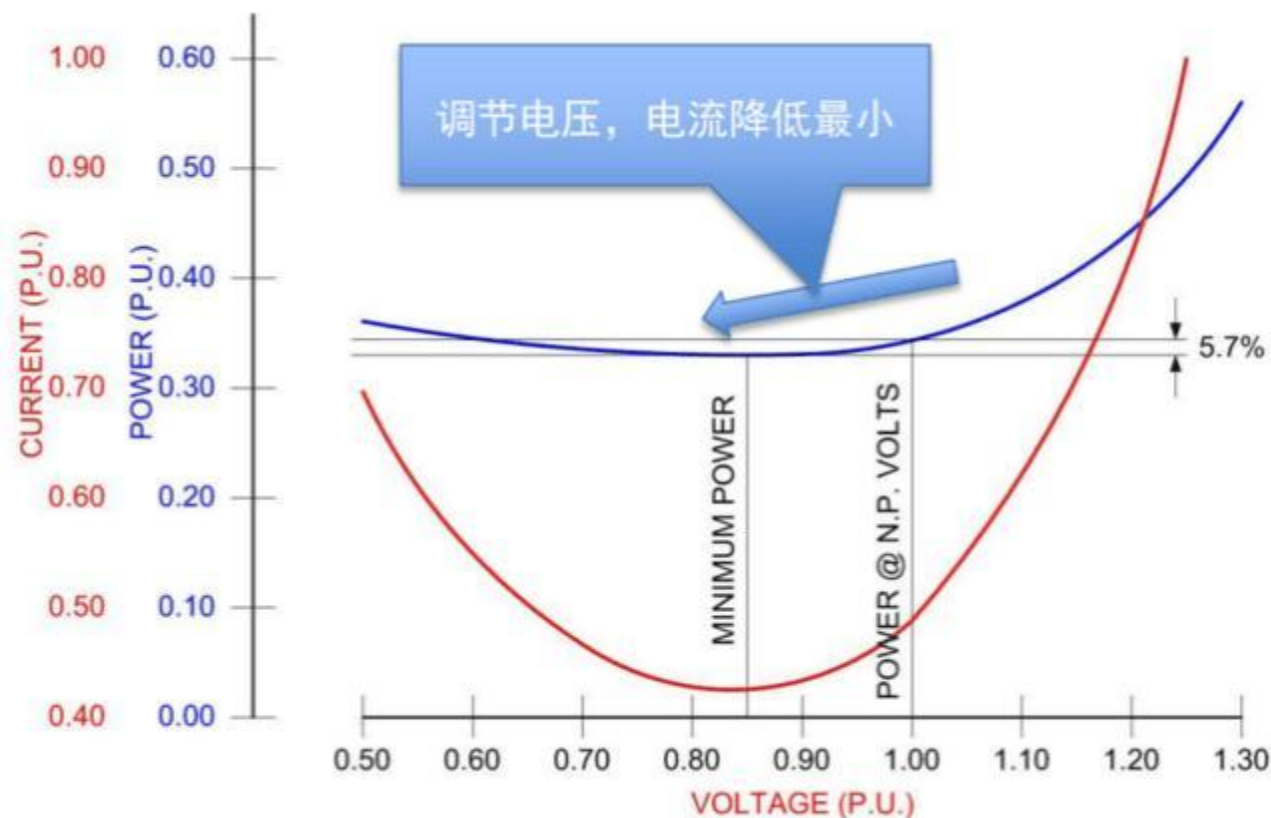
The interior adopts the drawer type modular design, which is convenient for on-site maintenance and replacement of parts, it also shorten the downtime and covers small floor space.

It provides RS485 communication interface and supports standard MODBUS-RTU protocol. The VFD can be connected to the remote monitoring system in the background through wired or wireless mode to monitor and control the operation of the electric submersible pump remotely in real time

The 10-inch industrial touch screen supports real-time switching of Chinese and English display, integrates the display and storage function of electric pump downhole sensor data, provides USB download interface, customer can use a USB disk to download and store various historical operation data, provides customized interface development.

Energy saving optimization control algorithm

According to the energy-saving requirements of submersion electric pump, a unique energy-saving control function of frequency converter output voltage self-optimization is developed. The algorithm controls frequency converter to automatically optimize the volt-per-hertz voltage frequency ratio of specific operating frequency, so as to find the most efficient configuration with the lowest power consumption. By maintaining a constant frequency, the frequency converter can increase/decrease the output voltage and minimize the energy consumption of the electric submersible pump.



Medium Voltage VFD

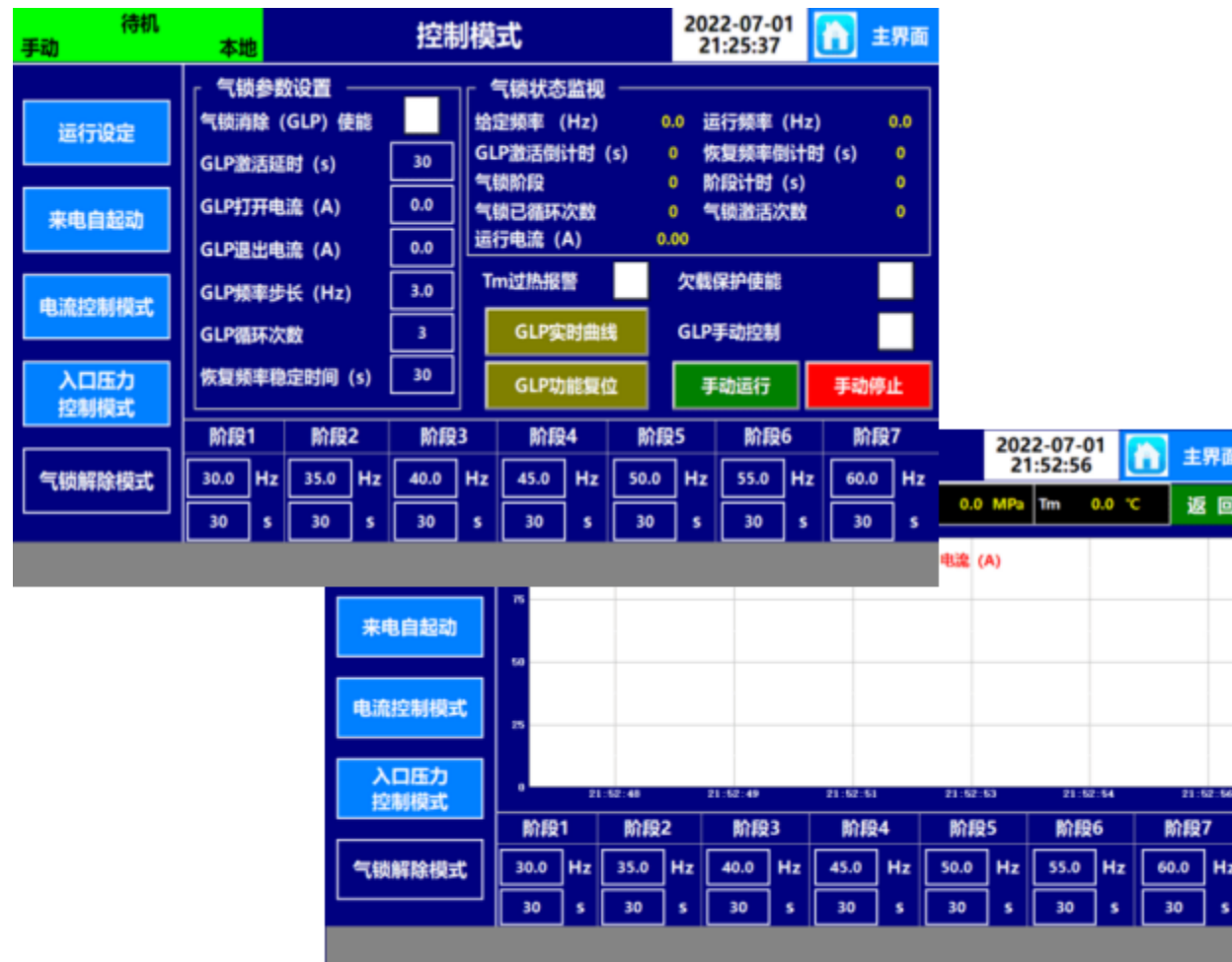
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Specifications | Features & Advantages | Applications



Gas Lock Algorithm

When the electric pump unit is frequently "Gas locked" in a high gas content well, it can switch to GLP (Gas Lock Protection) mode to try to restore the unit to normal operation. Gas lock release supports automatic and manual control mode. In previous projects in Indonesia, NIETZ products successfully relieved the "gas lock" shutdown problem faced by five Wells with high gas content.



Medium Voltage VFD

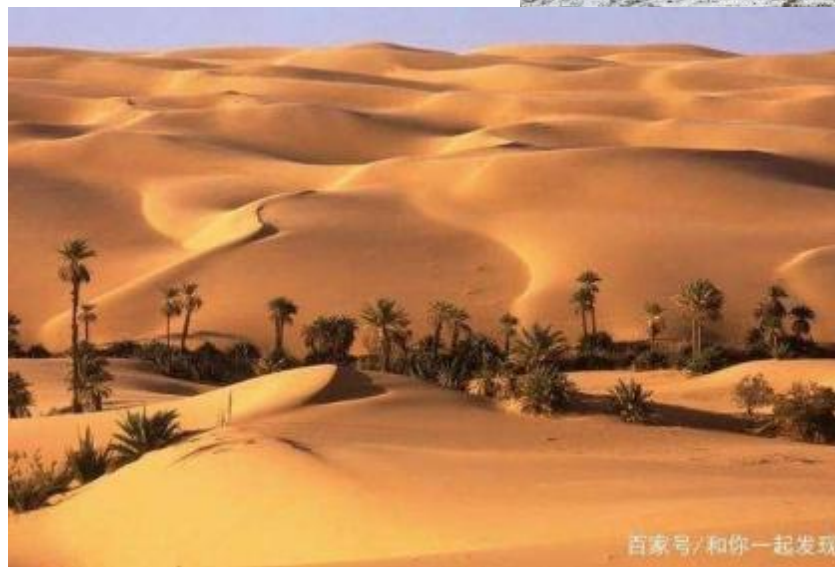
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Environment Adaptiveness

- It can operate reliably in the range of $-40^{\circ}\text{C} \sim +50^{\circ}\text{C}$ ambient temperature for a long time.
- The capacitor of the main loop adopts the film capacitor, which has a longer life than the electrolytic capacitor, and the resistance to low temperature can reach -40°C .
- Adopt independent cooling duct and high power axial fan imported from Germany, so that the product can work stably at the ambient temperature of $+50^{\circ}\text{C}$.



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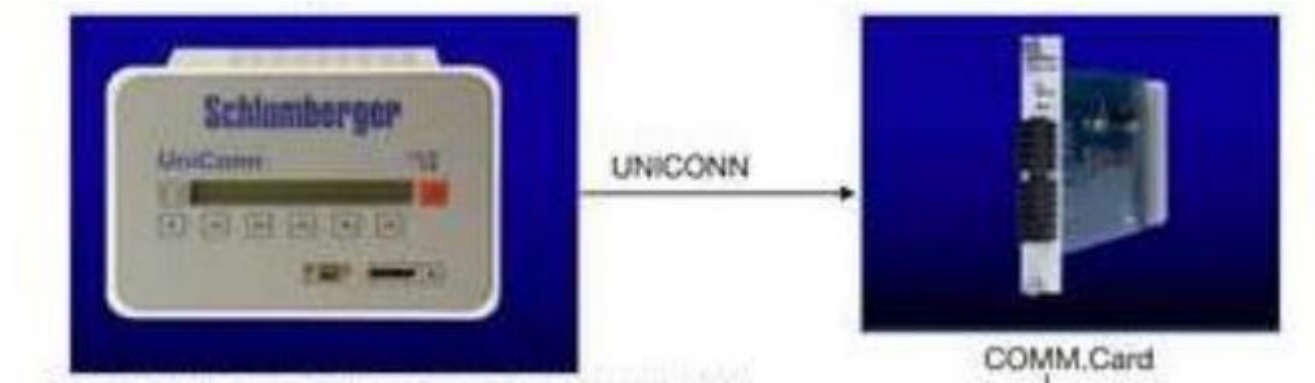
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Integrated and extensible capability

- Integrated pump downhole sensor for data display and storage, support Schlumberger, ZENITH, Triol and other pump sensor series.
- Support internal integrated output sine wave filter.
- Support input harmonic filter.
- Extendable input parameter measuring module.
- The electronic circular current card is provided, and the shape of the current card can be viewed directly on the touch screen.



Medium Voltage VFD

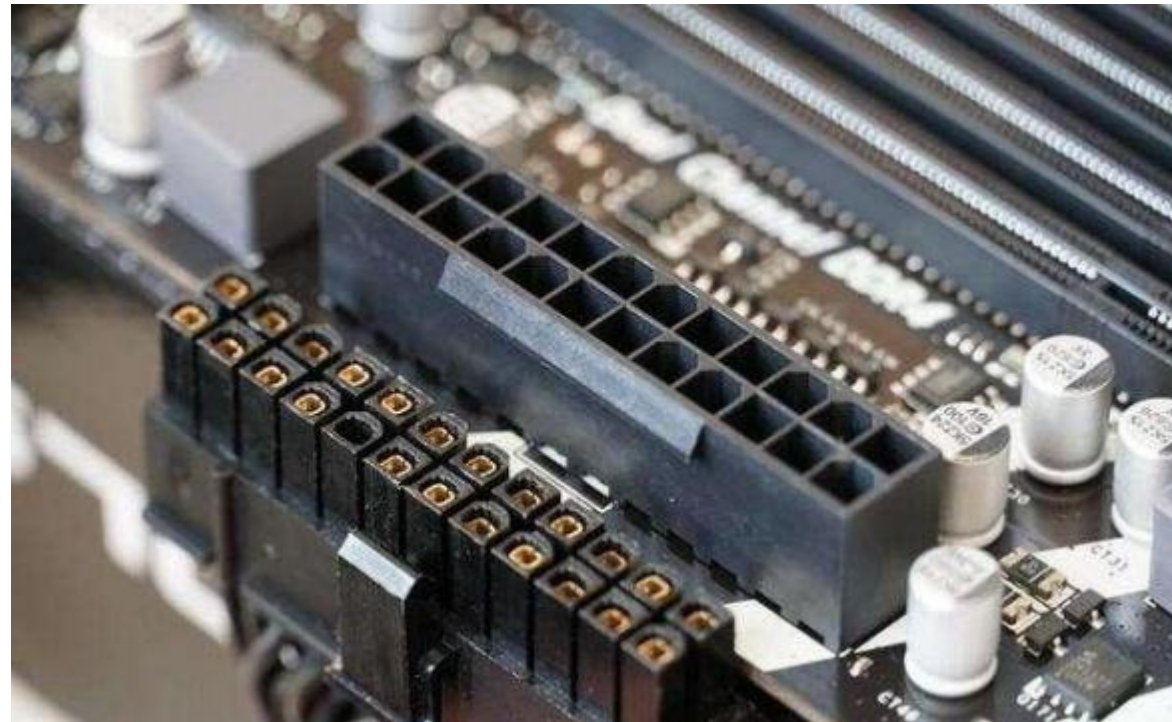
Introduction

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User Interface QTY

- 2 ways of AI
- 2 ways of AO
- 4 ways of DI
- 3 ways of DO
- 2 ways of RS485 interface
- Special input interfaces are provided for wellhead pressure protection switch, downhole sensor protection switch and power supply transformer protection switch.



Medium Voltage VFD Introduction

Specifications | Features & Advantages | Applications

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Typical Application Cases of Domestic Market



Daqing Oilfield

The first set of 1300V/65A variable frequency prototype was put into production in June 2016 and is still in operation. So far, NIETZ has put 72 sets of medium-voltage converters of this specification into production in Daqing oilfield.



Hunan Anhua hot spring bath well

Twelve sets of 12-pulse rectifier 1300V/65A converters are used in Anwar Hot Spring project. Since the project is powered by a local 380V civil grid, the use of frequency converters can prevent harmonics from interfering with the grid.



Xin Jian oil field

A total of 17 sets of 2600V/65A VFD have been applied in the Xing Jian oil field. Some oil Wells in Xinjiang are powered by gas generators and have deep electric submersible pumps. The input side adopts harmonic filter to suppress grid interference, and the output is equipped with sinusoidal filter to protect the long cable and motor.

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Typical Application Cases of Overseas Market



Indonesia

Seven sets of integrated skid bodies and 18 sets of VFD have been put into use for Indonesian offshore platform. In order to save space, the integrated skid structure is adopted, and each skid body is fixed with 2-3 VFD cabinets with integrated output filters.



Chad Oilfield of Africa

One hundred and one sets of 6-pulse 1300V/65A VFD have been put into use for the African Savanna project. The frequency converter is fixed in the pry body with air conditioning, and equipped with input/output filter cabinet.



Shengli Oilfield

Two sets of 2600V/105A VFD have been used in electric pump Wells of Shengli Oil Field offshore platform. According to user requirements, the VFD with constant frequency switching function and output sine wave built in.

Medium Voltage VFD Introduction

Product Specifications | Product Features | [Applications](#)



Typical Application Markets



Tahe Oilfield, Xinjiang

Applied in Tahe Oilfield, Xinjiang. The VFD is installed inside an air-conditioned skid, equipped with an input reactor and output filter cabinet. A total of 2 sets of 6-pulse 2600V/65A units are deployed.



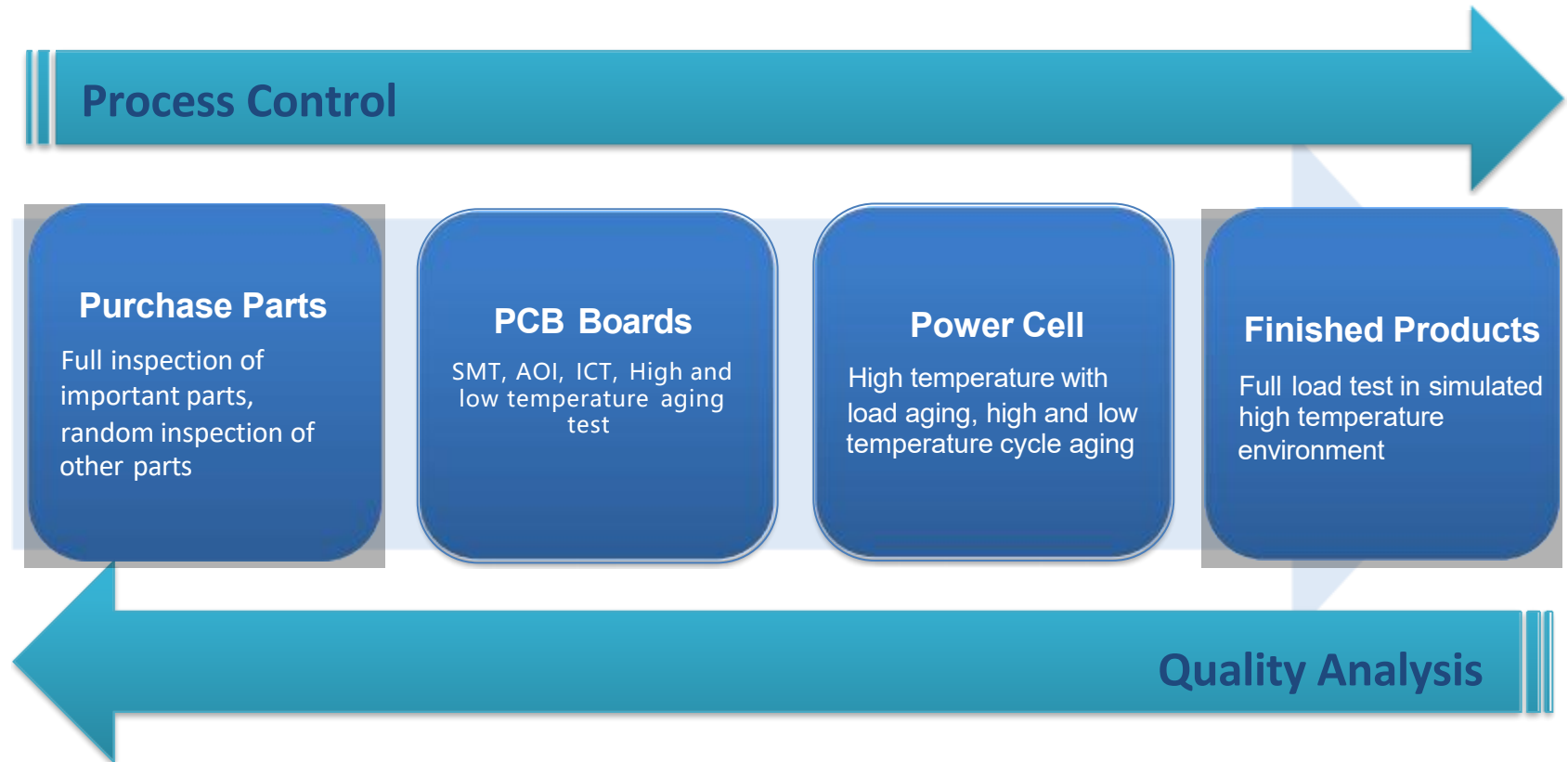
03

Quality control and service

| Quality control | Service |

A

Strict Process Control



B Complete Testing Means

Component Testing

- IGBT module tester, capacitance tester, capacitance leakage test device

Process Inspection

- Aging, EMI testing, integrated process detection platform

Inspection of Finished Product

- Multifunctional simulation test system, power quality analyzer, simulation load test device



PCB Test



Power cell
Assembling



PCB Board
Burning



Final test

C Reliable Parts Supply Chain

NIETZ has been committed to optimizing the production process while strictly implementing product quality control. In the production process, we adhere to 5S management, and implement PDCA to continuously optimize product quality and service quality.



Fully automatic SMT production line



Product assembly line



THT Production Line



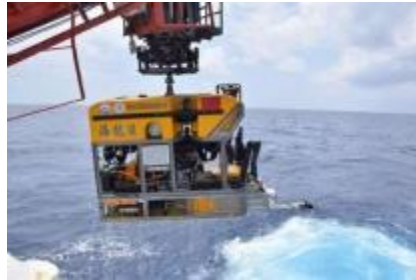
QCC Team

Quality Control and Service

Quality_control |

NIETZ

A Think what
customers think,
worry what
customers want.



Participate in the construction of electric submersible pump on offshore platform



Xinjiang oilfield after-sales service team



Conduct technical training for customers

Pre-Sale

- Field evaluation
- User communication
- Scheme customization

Middle-sale

- Installation guide
- Field debugging
- User training

After-sale

- Periodic maintenance
- On-site inspection
- User training

Company Culture



For the oilfield electric submersible pump to provide cost-effective, reliable surface equipment, and extend to the field of industrial control.

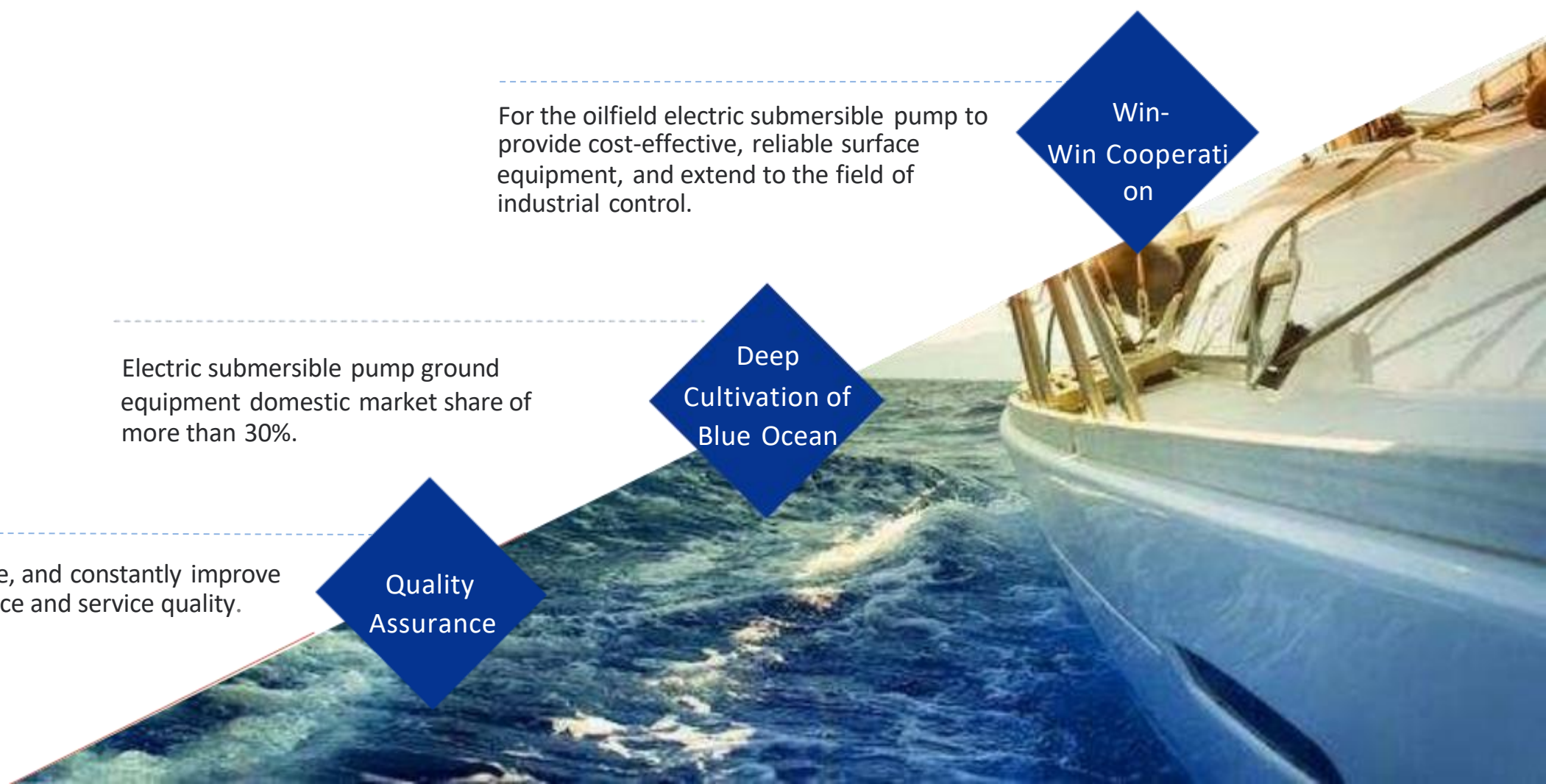
Win-Win Cooperation

Electric submersible pump ground equipment domestic market share of more than 30%.

Deep Cultivation of Blue Ocean

Expand product line, and constantly improve product performance and service quality.

Quality Assurance



**Thanks for
your attention**