

EMPORIUM ENERGY

WOLONG
Power your future

MV Drives

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Contents

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WOLONG
Power your future

Wolong Group Overview

THREE MAJOR INDUSTRIES

Manufacturing industry

Wolong Electric Group

Mining & Real Estate

Wolong Resources

Finance & Investment

Wolong Capital

COMPANY SIZE

7 Billion USD
Sales Revenue

5.3 Billion
Assets

42
Global Factories

18,000
Employees

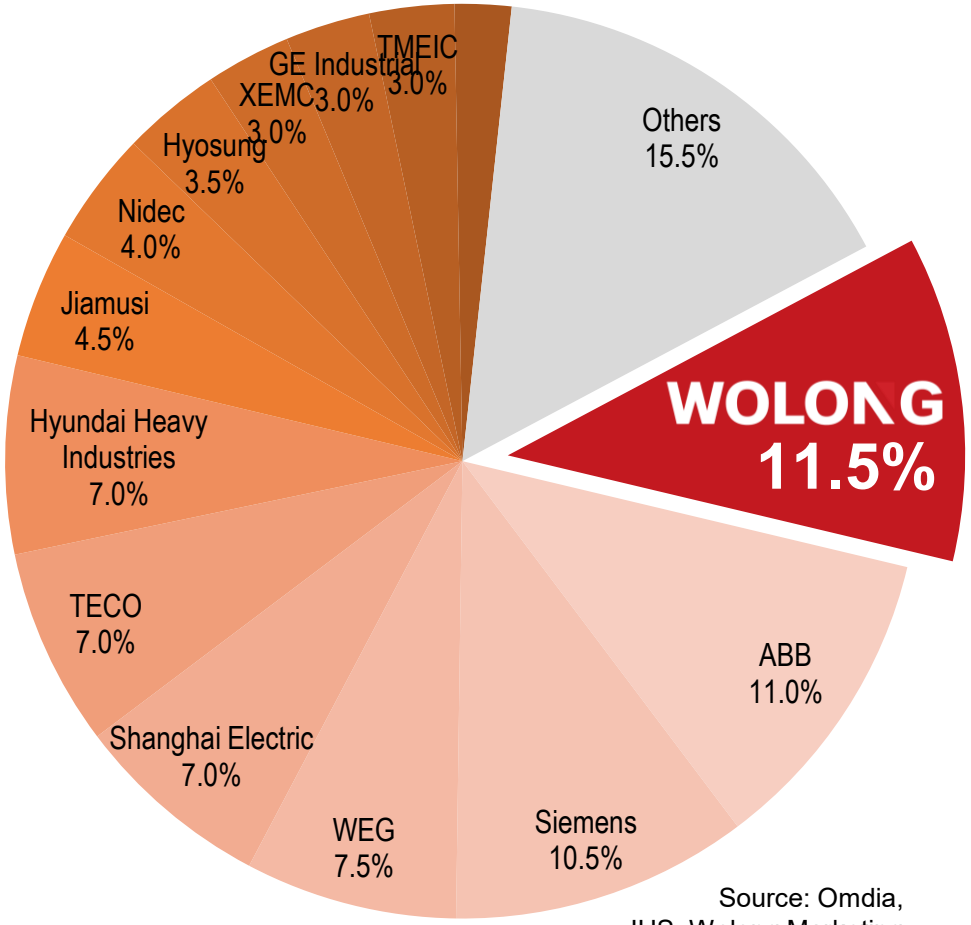
LISTED COMPANY

Wolong Electric Drive
SH600580

Wolong Resources
SH600173

Brook Crompton Holdings Ltd.
Singapore

Ranked No. 1 in MV Motors Globally [2022]



Source: Omdia, IHS, Wolong Marketing

Wolong LV Motor's Ranking Globally

Market share estimates for LV motors: World

Suppliers' share of market from 2021 to 2022

		2021	2022	Difference
1	ABB	16.00%	16.00%	0.00%
2	WEG	9.50%	11.50%	2.00%
3	Siemens	8.00%	7.50%	-0.50%
4	Wolong	8.00%	7.50%	-0.50%
5	Nidec	4.50%	4.50%	0.00%
6	Regal Beloit	4.00%	3.50%	-0.50%
7	TECO	3.00%	2.50%	-0.50%
8	Toshiba	2.00%	2.50%	0.50%
9	Hitachi	1.50%	2.00%	0.50%
10	Hyosung	2.00%	2.00%	0.00%
	Others	43.00%	40.50%	-2.50%

2021 market size: $13,024m
2022 market size: $14,210m
Date issued: July 2023
Source: Omdia

©2023 Omdia

Wolong LV Motor's Ranking in Asia & Oceania Area

Market share estimates for LV motors: Asia & Oceania

Suppliers' share of market from 2021 to 2022

		2021	2022	Difference
1	Wolong	8.5%	7.5%	-1.0%
2	ABB	7.5%	7.5%	0.0%
3	Siemens	7.5%	7.0%	-0.5%
4	Hitachi	4.5%	4.5%	0.0%
5	Hyosung	4.5%	4.0%	-0.5%
6	TECO	4.5%	4.0%	0.0%
7	Toshiba	3.0%	3.5%	0.5%
8	WEG	3.0%	3.0%	-0.5%
	Others	57.0%	59.0%	2.0%

2021 market size: $5,570m
2022 market size: $6,023m
Date issued: July 2023
Source: Omdia

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Wolong Drive Profile

26 years
focus on drive control
SINCE 1998



- **5** dedicated and supporting R&D centers



- **430** employees

3
major manufacturing bases
Asia/Europe

- **55000m²**
  Anshan Factory
- **20000m²**
  Shangyu Factory
- **5000m²**
  European Factory



60GVA VFD in operation



- **50** countries export
  Serving Customers Worldwide



- **3** major product series
  Drive control/power quality/new energy

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Global Footprint



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WOLONG AMERICA

Company Profile









Drive Division Factories

Total Production for Years

8000+

Sets of MV Drives & SVG

20000+

Sets of LV Drives and others

02 MV Drive Manufacturing Footprint



WD4000 Series
American Standard



WD6000 Series
EU Standard



WD5100 Series Air-cooled



WD5100 Series Water-cooled

High Power and Highly Customizable



VFD PRODUCTION GLOBAL LAYOUT



WD5000 Series

Integrated Type

Quality Certifications

Quality Certificates



萬泰認證

Quality Management System Certificate

This is to certify that the Management System established by

Wolong Electric Group Liaoning Rongxin Electric Drive Co.,Ltd.

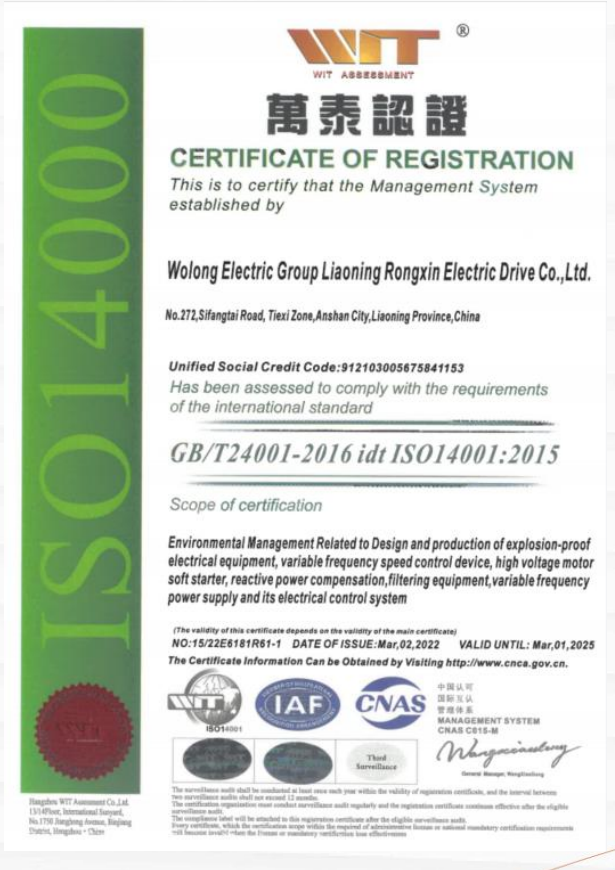
No.272,Sifangtai Road, Tiexi Zone,Anshan City,Liaoning Province,China

Unified Social Credit Code: 912103005675841153
has been assessed to comply with the requirements of the standard
GB/T19001-2016 / ISO9001:2015

Scope of certification:

Design and production of explosion-proof electrical equipment, variable frequency speed control device, high voltage motor soft starter, reactive power compensation,filtering equipment,variable frequency power supply and its electrical control system

ISO9001



ISO14000

萬泰認證

CERTIFICATE OF REGISTRATION

This is to certify that the Management System established by

Wolong Electric Group Liaoning Rongxin Electric Drive Co.,Ltd.

No.272,Sifangtai Road, Tiexi Zone,Anshan City,Liaoning Province,China

Unified Social Credit Code:912103005675841153
Has been assessed to comply with the requirements of the international standard

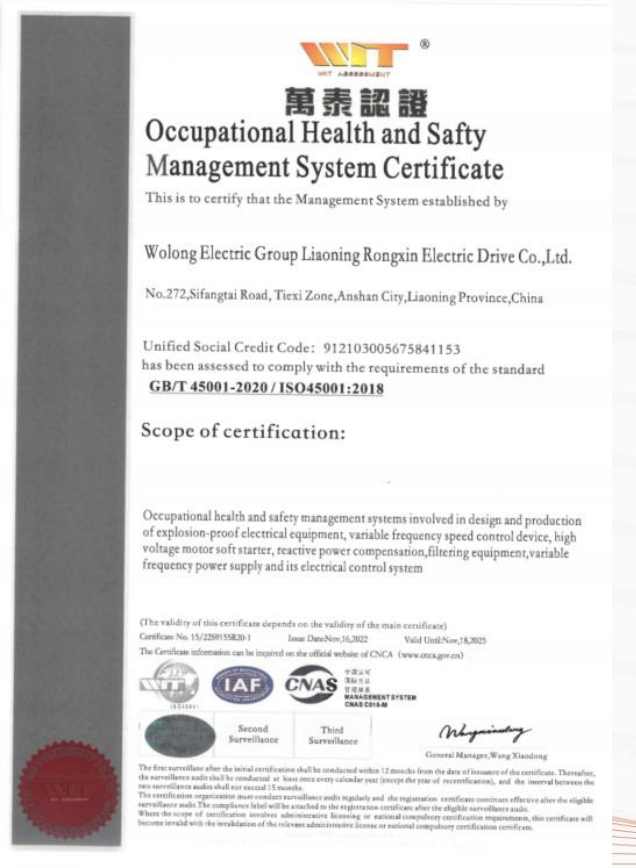
GB/T24001-2016 idt ISO14001:2015

Scope of certification

Environmental Management Related to Design and production of explosion-proof electrical equipment, variable frequency speed control device, high voltage motor soft starter, reactive power compensation,filtering equipment,variable frequency power supply and its electrical control system

(The validity of this certificate depends on the validity of the main certificate)
NO:15/22E6181R61-1 DATE OF ISSUE:Mar,02,2022 VALID UNTIL: Mar,01,2025
The Certificate Information Can be Obtained by Visiting http://www.cnca.gov.cn.

ISO24001



萬泰認證

Occupational Health and Safty Management System Certificate

This is to certify that the Management System established by

Wolong Electric Group Liaoning Rongxin Electric Drive Co.,Ltd.

No.272,Sifangtai Road, Tiexi Zone,Anshan City,Liaoning Province,China

Unified Social Credit Code: 912103005675841153
has been assessed to comply with the requirements of the standard
GB/T 45001-2020 / ISO45001:2018

Scope of certification:

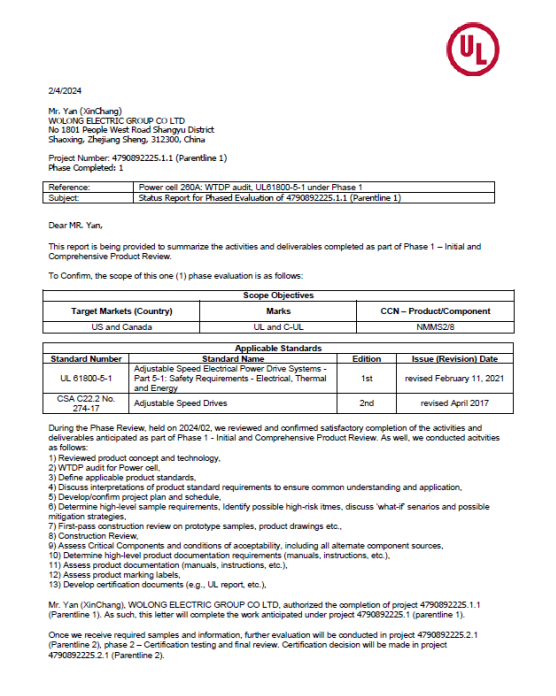
Occupational health and safety management systems involved in design and production of explosion-proof electrical equipment, variable frequency speed control device, high voltage motor soft starter, reactive power compensation,filtering equipment,variable frequency power supply and its electrical control system

ISO45001

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Product Certificates

- UL Recognized Component for 260A Power Cell
- UL Listing MV Frequency Drive (WD4000)**



2/4/2024

Mr. Yan (XinChang)
WOLONG ELECTRIC GROUP CO LTD
No 1801 People West Road Shangyu District
Shaoxing, Zhejiang Sheng, 312300, China

Project Number: 4790892225.1.1 (Parentline 1)
Phase Completed: 1

Reference:	Power cell 260A: WTDP audit, UL61800-5-1 under Phase 1
Subject:	Status Report for Phased Evaluation of 4790892225.1.1 (Parentline 1)

Dear MR. Yan,

This report is being provided to summarize the activities and deliverables completed as part of Phase 1 – Initial and Comprehensive Product Review.

To Confirm, the scope of this one (1) phase evaluation is as follows:

Scope Objectives		
Target Markets (Country)	**Marks**	**CCN – Product/Component**
US and Canada	UL and C-UL	NMMS2/8

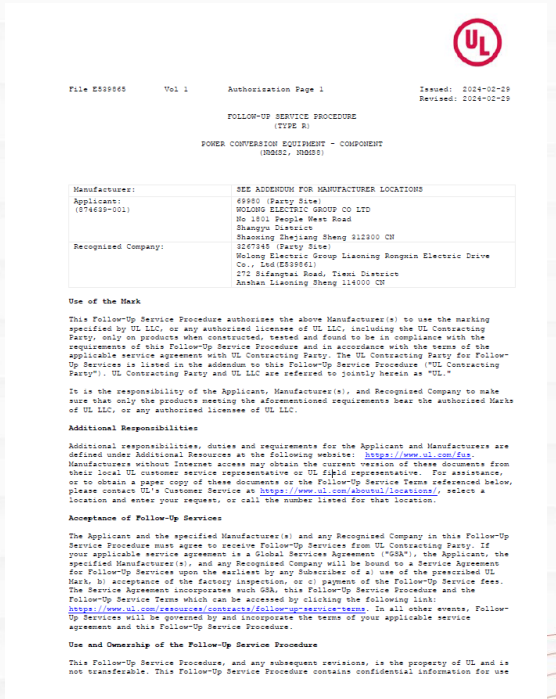
Applicable Standards			
Standard Number	**Standard Name**	**Edition**	**Issue (Revision) Date**
UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems - Part 5-1: Safety Requirements - Electrical, Thermal and Energy	1st	revised February 11, 2021
CSA C22.2 No. 274-17	Adjustable Speed Drives	2nd	revised April 2017

During the Phase Review, held on 2024/02, we reviewed and confirmed satisfactory completion of the activities and deliverables anticipated as part of Phase 1 - Initial and Comprehensive Product Review. As well, we conducted activities as follows:
1) Reviewed product concept and technology,
2) WTDP audit for Power cell,
3) Define applicable product standards,
4) Discuss interpretations of product standard requirements to ensure common understanding and application,
5) Develop/confirm project plan and schedule,
6) Determine high-level sample requirements, Identify possible high-risk items, discuss 'what-if' senarios and possible mitigation strategies,
7) First-pass construction review on prototype samples, product drawings etc.,
8) Construction Review,
9) Assess Critical Components and conditions of acceptability, including all alternate component sources,
10) Determine high-level product documentation requirements (manuals, instructions, etc.),
11) Assess product documentation (manuals, instructions, etc.),
12) Assess product marking labels,
13) Develop certification documents (e.g., UL report, etc.),

Mr. Yan (XinChang), WOLONG ELECTRIC GROUP CO LTD, authorized the completion of project 4790892225.1.1 (Parentline 1). As such, this letter will complete the work anticipated under project 4790892225.1 (parentline 1).

Once we receive required samples and information, further evaluation will be conducted in project 4790892225.2.1 (Parentline 2), phase 2 – Certification testing and final review. Certification decision will be made in project 4790892225.2.1 (Parentline 2).

UL Listing Review (Drive)



File E539865 Vol 1 Authorization Page 1 Issued: 2024-02-29 Revised: 2024-02-29

FOLLOW-UP SERVICE PROCEDURE
(TYPE R)

POWER CONVERSION EQUIPMENT - COMPONENT
(NMMS2, NMMS8)

Manufacturer:	SEE ADDENDUM FOR MANUFACTURER LOCATIONS
Applicant: (574699-001)	65880 (Party Site) WOLONG ELECTRIC GROUP CO LTD No 1801 People West Road Shangyu District Shaoxing Zhejiang Sheng 312300 CN
Recognized Company:	3267345 (Party Site) Wolong Electric Group Liaoning Rongmin Electric Drive Co., Ltd(E539861) 272 Sifangtai Road, Tiexi District Anshan Liaoning Sheng 114000 CN

Use of the Mark

This Follow-Up Service Procedure authorizes the above Manufacturer(s) to use the marking specified by UL LLC, or any authorized licensee of UL LLC, including the UL Contracting Party, only on products when constructed, tested and found to be in compliance with the requirements of this Follow-Up Service Procedure and in accordance with the terms of the applicable service agreement with UL Contracting Party. The UL Contracting Party for Follow-Up Services is listed in the addendum to this Follow-Up Service Procedure ("UL Contracting Party"). UL Contracting Party and UL LLC are referred to jointly herein as "UL."

It is the responsibility of the Applicant, Manufacturer(s), and Recognized Company to make sure that only the products meeting the aforementioned requirements bear the authorized Marks of UL LLC, or any authorized licensee of UL LLC.

Additional Responsibilities

Additional responsibilities, duties and requirements for the Applicant and Manufacturers are defined under Additional Resources at the following website: https://www.ul.com/fus. Manufacturers without Internet access may obtain the current version of these documents from their local UL customer service representative or UL field representative. For assistance, or to obtain a paper copy of these documents or the Follow-Up Service Terms referenced below, please contact UL's Customer Service at https://www.ul.com/aboutul/locations/, select a location and enter your request, or call the number listed for that location.

Acceptance of Follow-Up Services

The Applicant and the specified Manufacturer(s) and any Recognized Company in this Follow-Up Service Procedure must agree to receive Follow-Up Services from UL Contracting Party. If your applicable service agreement is a Global Services Agreement ("GSA"), the Applicant, the specified Manufacturer(s), and any Recognized Company will be bound to a Service Agreement for Follow-Up Services upon the earliest by any Subscriber of a) use of the prescribed UL Mark, b) acceptance of the factory inspection, or c) payment of the Follow-Up Service fees. The Service Agreement incorporates such GSA, this Follow-Up Service Procedure and the Follow-Up Service Terms which can be accessed by clicking the following link: https://www.ul.com/resources/contracts/follow-up-service-terms. In all other events, Follow-Up Services will be governed by and incorporate the terms of your applicable service agreement and this Follow-Up Service Procedure.

Use and Ownership of the Follow-Up Service Procedure

This Follow-Up Service Procedure, and any subsequent revisions, is the property of UL and is not transferable. This Follow-Up Service Procedure contains confidential information for use

Recognized Component (Power Cell)

**Expected completion: November 2024

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Product Certificates

- Certificate issued by TüV Rheinland,Germany
- Standard Applied: IEC61800 series



CERTIFICATE
of Conformity
EC Council Directive 2014/30/EU
Electromagnetic Compatibility

Registration No.: AE 50438007 0001
Report No.: 50232784 001

Holder: WOLONG ELECTRIC GROUP LIAONING RONGXIN ELECTRIC DRIVE CO.LTD. No.272,Sifangtai Road, Tiexi District Anshan,Liaoning 114000 P. R. China

Product: Converter (Medium Voltage Variable Frequency Drive)

Identification: Type Designation: RMVCS100-11/X-Y (X=28-280,Y=AT,ST) RMVCS100-10/X-Y (X=29-280,Y=AT,ST) RMVCS100-6.6/X-Y (X=28-438,Y=AT,ST) RMVCS100-6.3/X-Y (X=30-460,Y=AT,ST) RMVCS100-6/X-Y (X=28-480,Y=AT,ST) RMVCS100-5.5/X-Y (X=30-480,Y=AT,ST) RMVCS100-4.16/X-Y (X=36-481,Y=AT,ST) RMVCS100-3.3/X-Y (X=26-480,Y=AT,ST) RMVCS100-3/X-Y (X=26-480,Y=AT,ST)

Tested acc. to: EN 61800-3:2004+A1

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2014/30/EU. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to the a.m. Directive.

Certification Body
Sun Lixun

Date 14.06.2019

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may only be used if all relevant and effective EC Directives are complied with. CE

EMC Certificate



CERTIFICATE
of Conformity

Registration No.: AK 50436152 0001
Report No.: 16805381 002

Holder: WOLONG ELECTRIC GROUP LIAONING RONGXIN ELECTRIC DRIVE CO.LTD. No.272,Sifangtai Road, Tiexi District Anshan,Liaoning 114000 P. R. China

Product: Converter (Medium Voltage Variable Frequency Drives)

Identification: Type Designation: RMVCS100-10/280-AT
Rated voltage : 10 kV(11kV in Europe)
Rated current : 280 A
Rated power : 5000 kVA

Remark:RMVCS100-10/280-AT for China and RMVCS100-11/280-AT for Europe are equivalent. Refer to test report 16805381 002 for details.

Tested acc. to: EN 61800-5-1:2007

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body
Bo Liu

Date 13.05.2019

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

AK Certificate for Complete Unit Safety



CERTIFICATE
of Conformity
Low Voltage Directive 2014/35/EU

Registration No.: AN 50436151 0001
Report No.: 16805381 003

Holder: WOLONG ELECTRIC GROUP LIAONING RONGXIN ELECTRIC DRIVE CO.LTD. No.272,Sifangtai Road, Tiexi District Anshan,Liaoning 114000 P. R. China

Product: Control Cabinet (System control and sequencing)

Identification: Type designation: RMVCS100-CTRL
Serial number : Engineering sample
Rated voltage : AC 380V
Rated power : 250W

Remark: The test according to EN 61800-5-1:2007. RMVCS100-CTRL can control VFD of RMVCS100 series.

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with Annex I of Council Directive 2014/35/EU, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex IV of the Directive.

Certification Body
Bo Liu

Date 14.05.2019

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

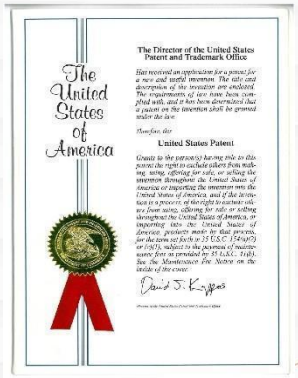
Low Voltage Directive

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Patents

Patents and Utility Models









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02

Product Line

Product Overview

WD4000, WD5000 WD6000 air-cooled VFD



250-3500kVA

WD5100 high voltage VFD



250-20000kVA

WD5100 water-cooled VFD



2000-80000kVA

Hydrogen-making power supply AEM Electrolyser



Up to 20000A

SVG Product



200kVAR-100MVAR

Shore Power Supply System (Cold-Ironing)



200-20000kVA

WD Engineering LV VFD



250-6500kW

Flame-proof Product (LV+MV)



200-2000kW

Energy Storage Product (LV+MV)



Up to 100MW(35kV)

Wolong Drive's IGBT-Based Products

Wolong Drives

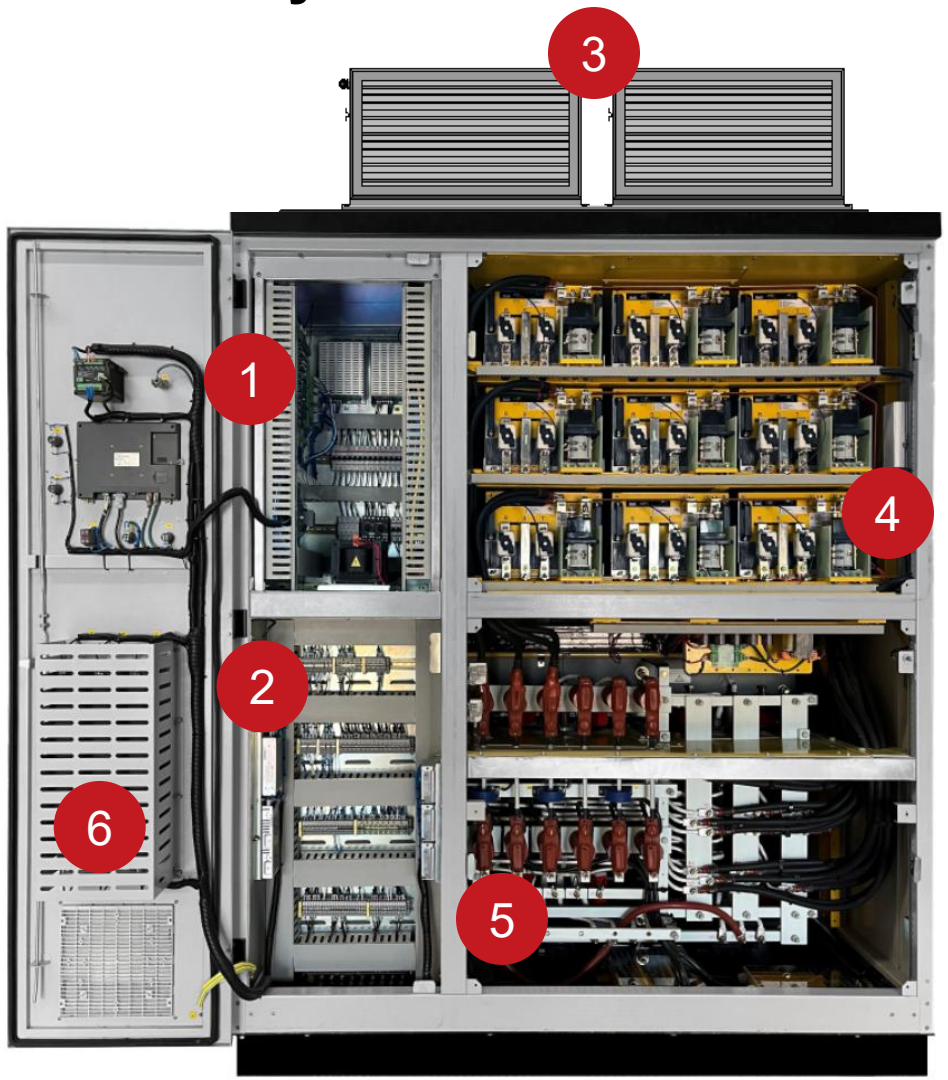
- Outputs: 2.4-13.8kV, 0-120Hz
- Inputs: 2.4-13.8kV (others on request), 50/60 Hz
- Cascaded H-Bridge Topology
- IGBT based UR Certified Power Modules
- Air Cooled and Water Cooled
- High power density: super compact frame
- Multi-level inverter
- National certifications
- Two-quadrant DFE and Four Quadrant AFE



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WD4000 Layout



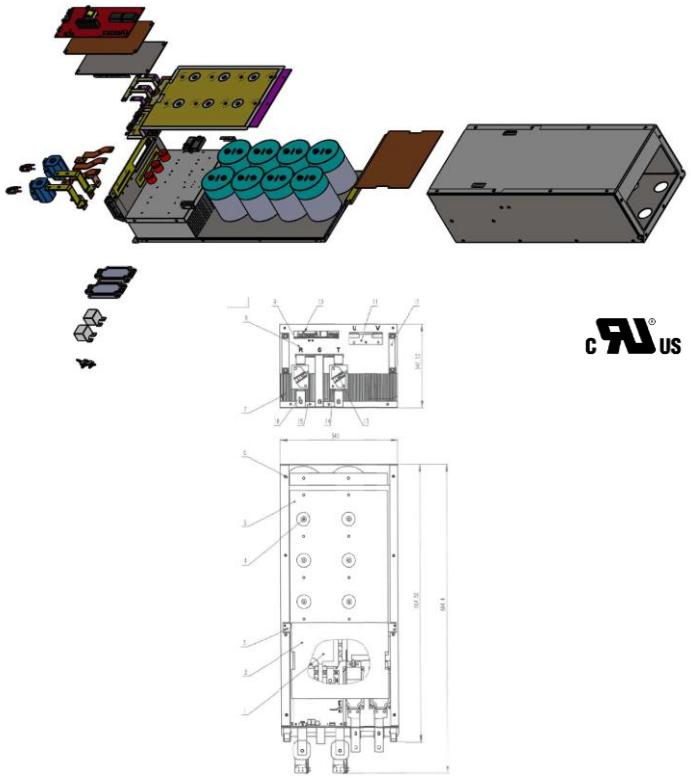
1. Main control board / HMI
2. Control I/O Modules
3. Redundant cooling axial fans
4. Power Modules
5. Power terminals (front), Transformer (back)
6. Pre-charge resistors

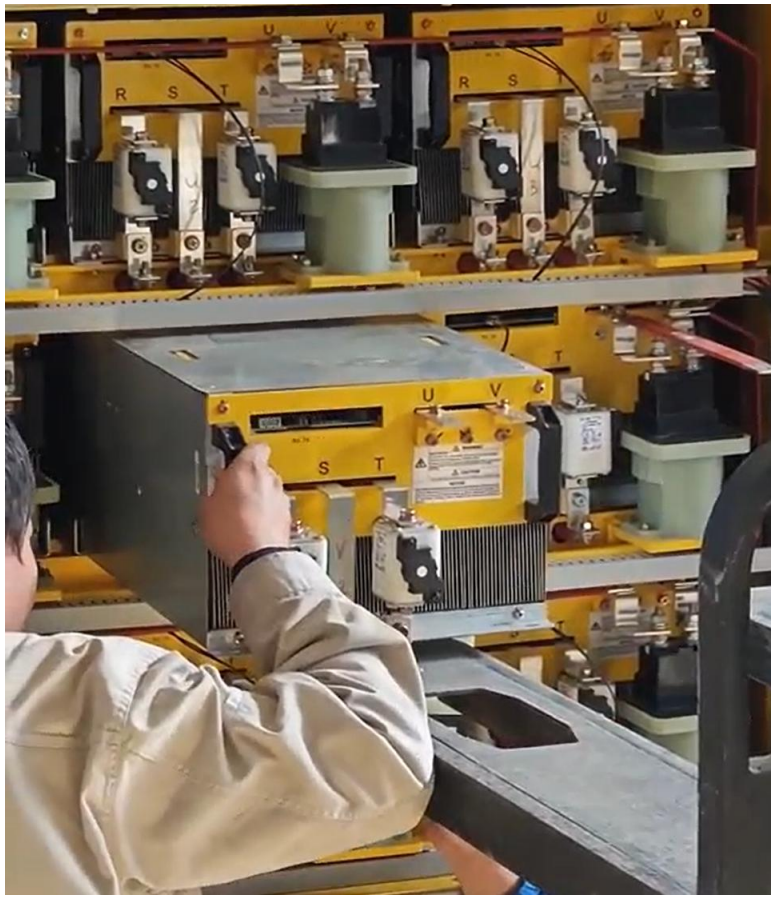
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Wolong manufactured **Power Modules** [Feature: quick-swap, bypass]

Transformer is copper as a standard.





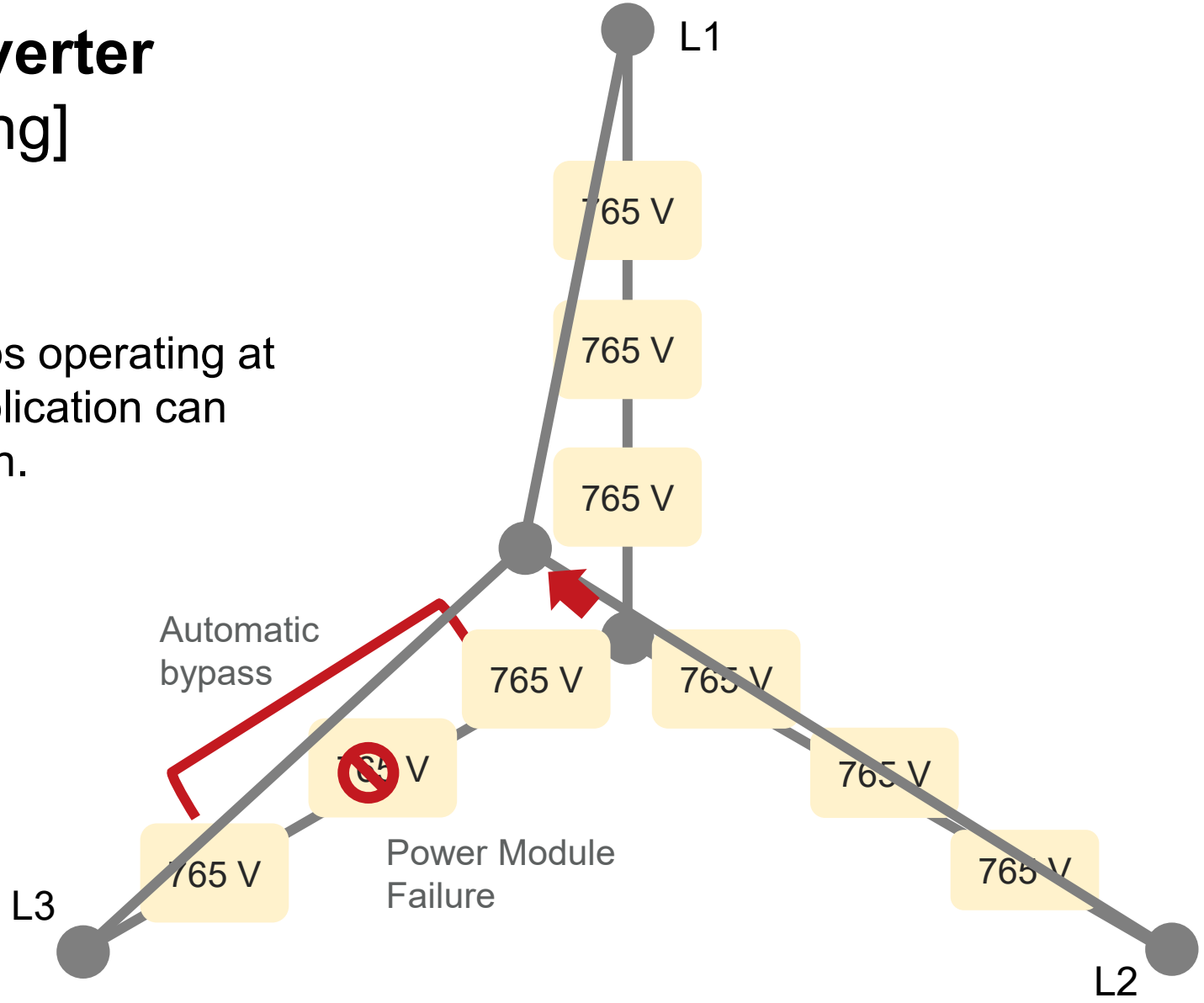
- **765V**
- 260A
- Two-level inverter
- Air Cooled
- Standard **bypass**
- Fast fused
- Temperature detections at inverter and DC-Link
- Film capacitors
- **UL** recognized component

© Wolong Electric America, LLC

Cascaded H-Bridge VSI **Inverter** [Feature: Neutral rebalancing]

When a power module fails, VFD keeps operating at reduced output power. No trip and application can keep running until controlled shut down.



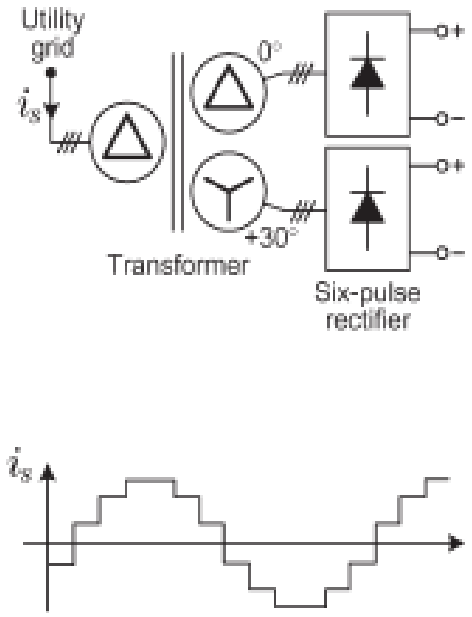


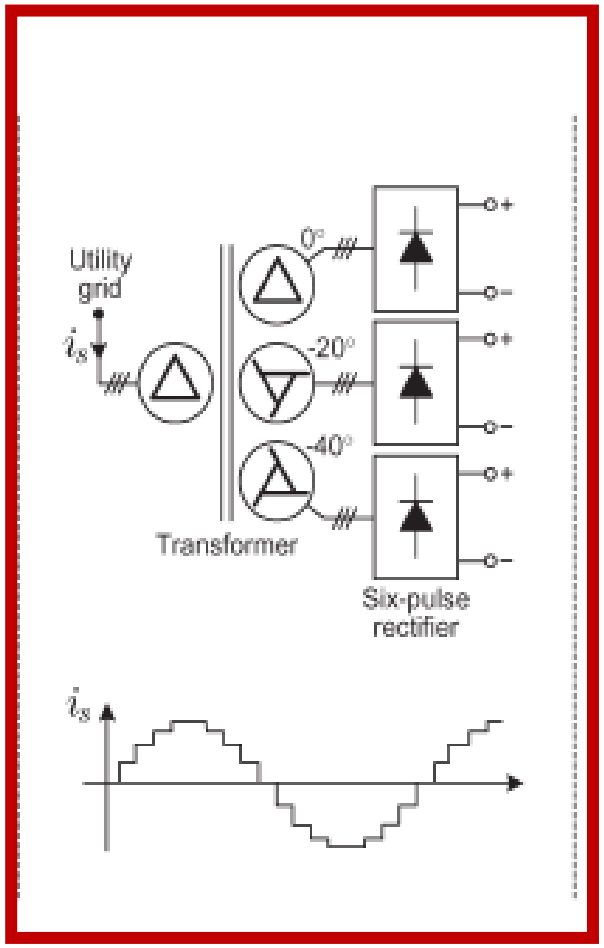
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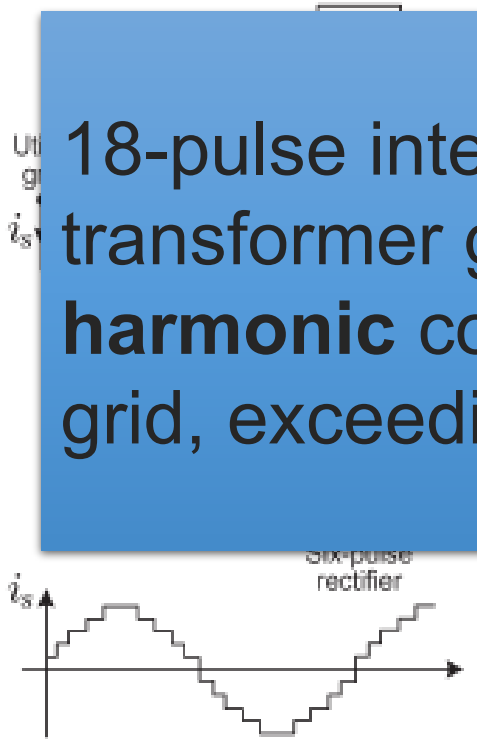
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Integrated phase-shifting **Transformer** [Feature: low harmonic grid]

Transformer is copper as a standard.







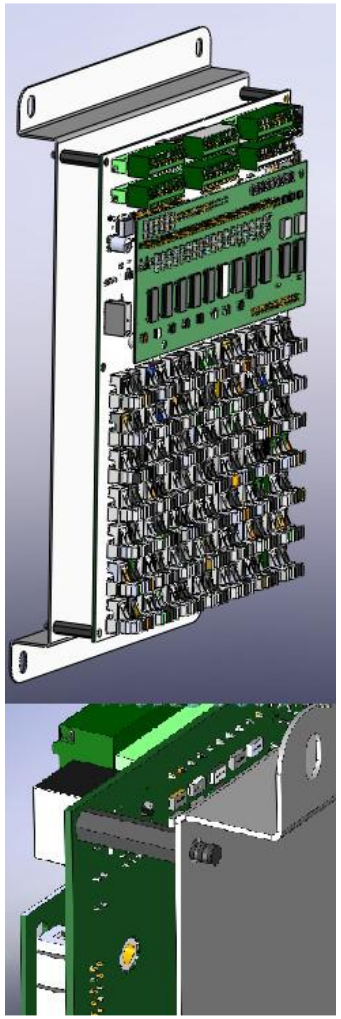
18-pulse integrated transformer gives excellent **harmonic** content to the grid, exceeding IEEE519

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WOLONG AMERICA

Wolong-manufactured Control Board





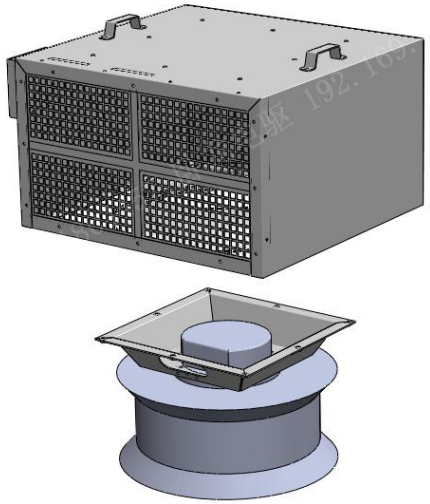
- Main VFD control
- 13 Digital Inputs
- 18 Digital Outputs
- 2 Analog Inputs
- 4 Analog Outputs
- 1 encoder input
- RJ45 Ethernet interface
- Fiber optic interface to PM
- MODBUS standard interface, others with external module
- Expansion space in Control Section

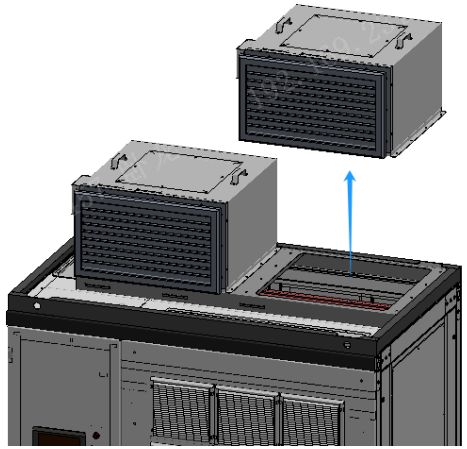
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Thermal management

STANDARD FEATURES:

- 2 x 100% **redundancy**
- **EC-Fans**
- Controllable
- High efficiency
- **Low** noise
- **Segregated** air paths
- Independent temperature monitoring







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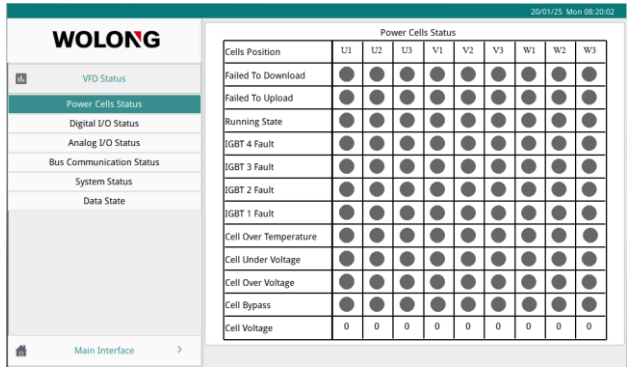
WOLONG AMERICA

HMI

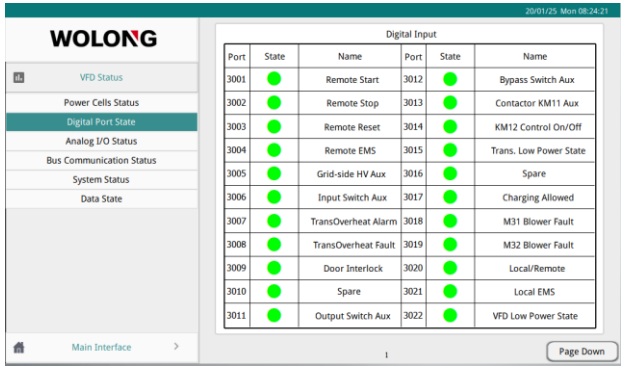
MAIN SCREEN



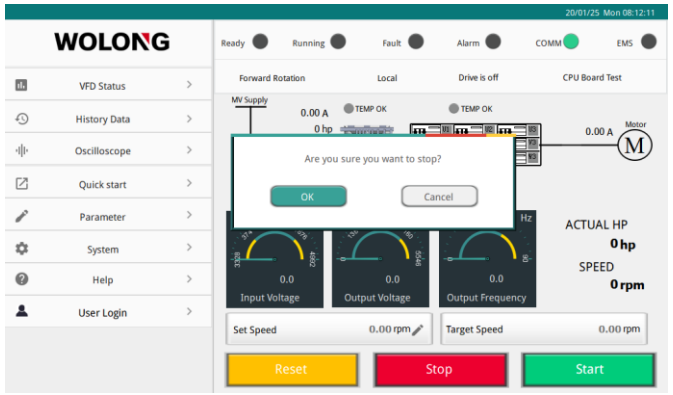
POWER CELL STATUS



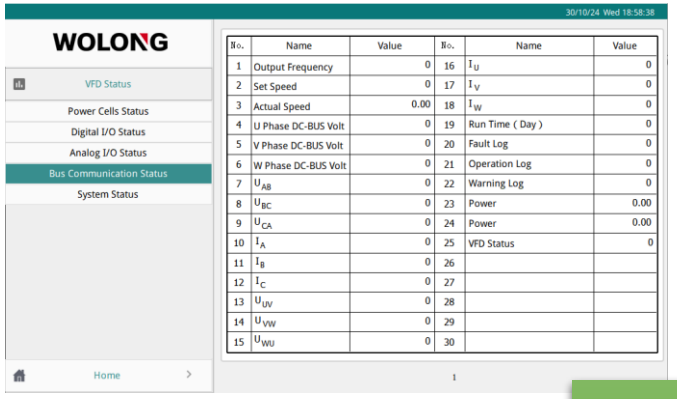
I/O STATUS



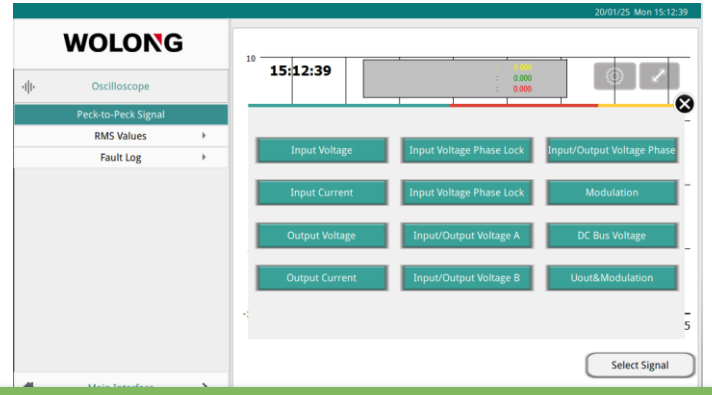
PROMPTS

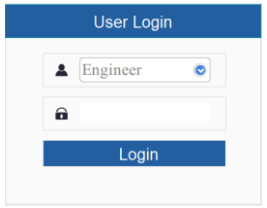


MODBUS MAP



OSCILLOSCOPE



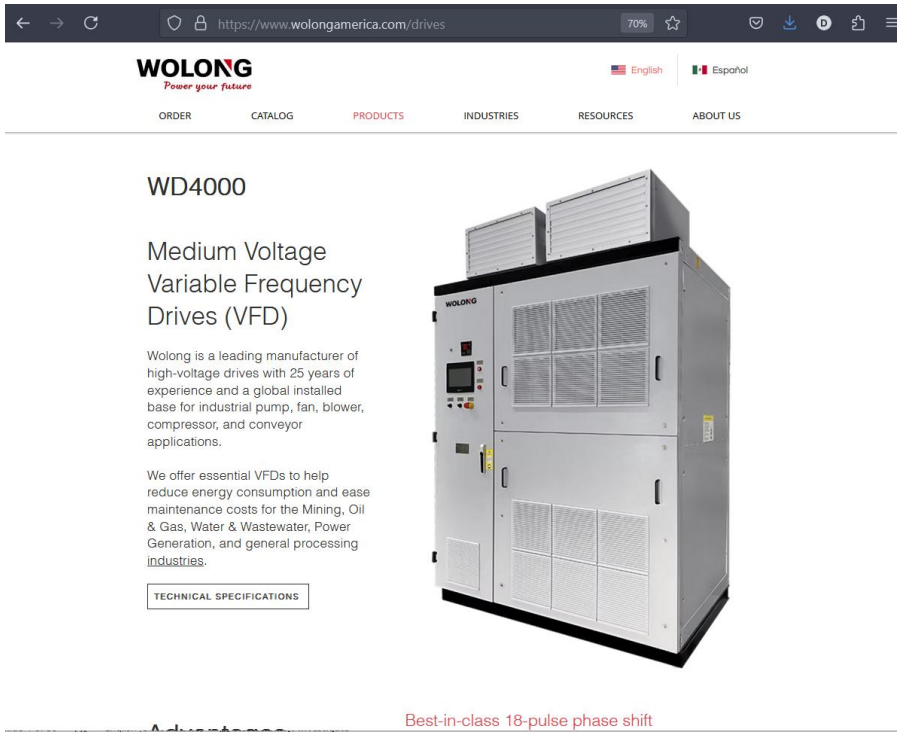


LOGIN

Fully operable and configurable thru the HMI screen on board. Wolong logo is the default

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Resources



Brochure



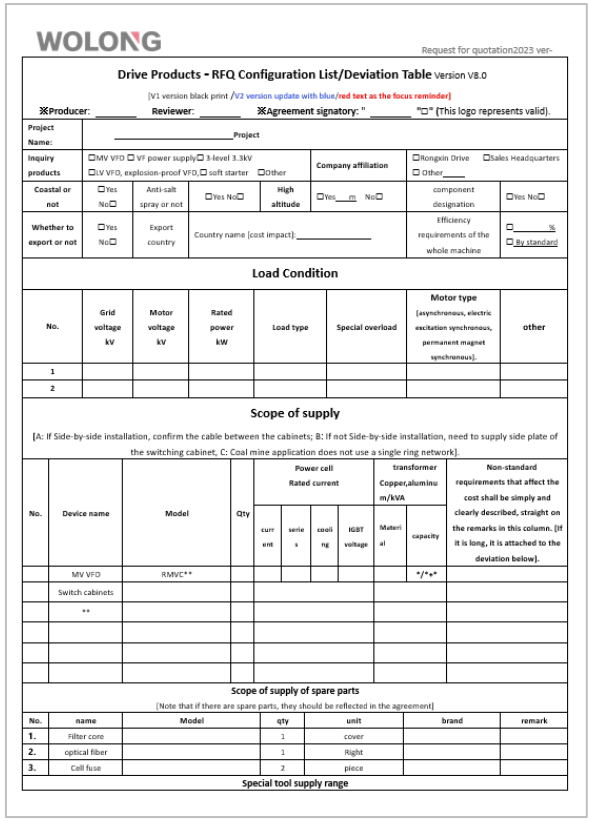
Flyer



Videos



RFQ/Spec Sheet



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WOLONG AMERICA

Applications



Electric Power

- Fan , feed pump, condensate pump

State Power Group,
China DATANG



Oil and Gas

- Oil pump, Compressor

SINOPEC, Pipe China
CNPC, Bake Hughes



Nuclear Power

- Circulation pump

CNNC(China National Nuclear Corporation)



Chemical

- Compressor

Wanjing/MEIDE Chemical
Zhenhua Oil,
WANHUA Chemical



Metallurgy

- Main exhaust fan, cooling fan

An Steel, Bao Steel,
Hebei Steel Group



Mining

- Crusher, slurry pump, belt conveyor,hoist

China Coal Group,
China SHENHUA Energy



Shore Power

- Various Ships

Tianjin Port, Shanghai, Shenzhen, Haifa Israel



Gas-making

- Compressors

Linde, FORTUNE GAS



Green Hydrogen

- Hydrogen Electrolyzer

CPECC



Off-shore Platform

- Compressor, pump

CNOOC,SBW,ShaanGu



Thank You

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