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Shanghai RENLE
Science&Technology Co., Ltd.

Shanghai RENLE Science & Technology Co., Ltd
No.3988 Chengbei Road, Jiading District, Shanghai,201807, P. R. China
Tel: +86-21-3953 8058, 5996 6666
Fax: +86-21-3953 8129
E-mail: export@renle.com

RENLE Europe GmbH
Maxstrasse 23
22081 Hamburg，Germany
Fon: 0049-40 - 25 08 41 5
Fax: 0049-40 - 50 09 70 43

http://www.renle.com
National toll free service hotline: +86 800-8200-785
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WeChat Public Service Account

RENLE

Professional manufacturer of
Smart Grid · New Energy · Electric Drive

RNHV SERIES

HV VFD (AC DRIVE)

Technical innovation benefits the world

Stock code：833586

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Shanghai RENLE
Science&Technology Co., Ltd.

Professional manufacturer of Smart Grid • New Energy • Electric Drive

RENLE

Shanghai RENLE Science & Technology Co., Ltd is a designer and product provider of energy saving system for intelligent electric industry, as well as an integrator of solutions f or control system. Renle' s products include LV motor soft starter, LV frequency inverter (VFD or AC drive), intelligent electric equipment, new energy electric equipment and complete sets of LV/HV power transmission and distribution equipment etc. The products are widely used in different kinds of industries and fields, such as electric power industry, metallurgical industry, petroleum and petrochemical industries, mines, chemical industry, construction industry, construction material industry, municipal engineering, military industry, light industry, textile, printing and dyeing, papermaking and pharmaceutical industries etc. Renle' s products are well exported to many countries and areas in the world.

Renle' s products have been used as parts of complete national key projects, such as Expo 2010 Shanghai China, 2008 Beijing Olympic Games, Yangshan Deepwater Port Project of Shanghai International Shipping Center, Shanghai Pudong Airport, Shanghai Hongqiao Airport, the Three Gorges Project, Gansu Satellite Launching Center, South-to-North Water Diversion Project, West-to-East Natural Gas Transmission Project, China National Petroleum Corp. , SINOPEC, Double Coin Type Group Ltd., and Shandong Linglong Tire Co., Ltd. etc. The products receive unanimous appraise from the customers for excellent quality and perfect after-sales service.

In China, RENLE is a pioneer who has firstly passed the certification of ISO9001 Quality Management System, ISO 14001 Environment System, OHSAS 18001 Occupational Health and Safety Management System, CE, TUV, GOST and national CCC etc. RENLE has been continuously introducing internationally advanced production and test equipment, and has established laboratories and provided R&D experiment base to domestic universities and colleges. Approved by National Human Resources and Social Security Bureau, RENLE has established a post-doctoral workstation. This showsthat RENLE cooperates with universities for setting up platforms for teaching and study. This raises the independent innovation ability and R&D ability of the enterprise.

For many years Renle has been striving for and devoted to production modernization, administration collectivization, production specialization and technical leading. Renle has achieved many honors: Key High-tech Enterprise of National Torch Program, High and New Tech Enterprise, National Enterprise of Credit, State-level Key New product, Shanghai Innovative Enterprises, Shanghai Enterprise Certifying Technology Center, Shanghai RenownedBrand, Shanghai Famous Brand Product, Shanghai Key New Product, Shanghai Renowned and High QualityProduct, Post-doctoral workstation and Smart Grid R&D centers.

Renle will continually develop energy saving, high efficient, precise and humanized products, as well as help customers realize economic transformation and industrial upgrading with unique industrial control technology, advanced and applicable innovation products and profoundly integrated solution. In addition, Renle will speed up its pace of internationalization, satisfy the customers with quality and try to become a world renowned professional supplier of smart electric equipment!

RENLE

Outline of Renle

Product overview

RNHV series smart medium voltage variable frequency drive (AC drive or frequency inverter), adopting power cell series connection technology, directly outputs 6 and 10kV voltage. It is a high voltage-high voltage VSI (Voltage Source Input) VFD. Renle regards high reliability, simplified operation and high performance as its design goal so as to meet the urgent requirements of the users for mechanical speed control and energy saving of fan and pumps and improvement of production technologies etc. In order to shorten the construction period required for installation and reconstruction of MV VFD system, Renle introduces the integrated design for the drive, which consists of all components and inner wiring of transformer cabinet, power cabinet, control cabinet and MV switchgear (bypass cabinet is optional). The user is only required to connect MV input/output cables, LV control power supply and control signal cables etc. The complete drive has been wholly tested prior to delivery so that both quality and performance of every product is guaranteed.

In order to meet the requirement of transformation project and reduce the investment of new project, every function part of RNHV series frequency inverter can be installed step by step. In this way, it is ensured that there is no accident during transportation and installation. Convenient front-back maintenance, high-performance key imported components, and advanced production technologies, all these greatly reduce the requirements of the drive for the site environment.

Type Description

RN HV — A-□/□

- Output power
- Output voltage: 6 for 6 kV, 10 for 10 kV
- Category of motor: A - asynchronous motor; S - synchronous motor
- Medium voltage variable frequency drive (frequency inverter or AC drive)
- Shanghai Renle Science & Technology Co., Ltd

The VFD is widely used for

Thermal power plant

— Such as fan, compressor, pumped storage pump, induced draft fan, condensate pump, circulating water pump and boiler feed pump etc.

Petroleum, petrochemistry and natural gas

— Such as pipeline transportation pump, water injection pump, water feed pump, submersible pump, circulating water pump, brine pump, compressor, pressure blower, oil transfer pump and electric submersible pump etc.

Coal industry and mines

— Such as scale removing pump, mud pump, slurry pump, clean water pump, feeding pump, axial flow fan, stirring pump, kiln, belt conveyer, dedusting fan, drainage pump, medium pump and counter-rotating fan etc.

Steel industry and nonferrous metallurgy

— Such as blast furnace blower, induced draft fan, compressing blower, draft blower, water feed pump, water supply pump, dephosphorization pump, dedusting fan, converter and blast furnace etc.

Cement and construction material

— Such as blast furnace blower, induced draft fan, compressing blower, draft blower, water feed pump, water supply pump, dephosphorization pump, dedusting fan, converter and blast furnace etc.

Municipal construction

— Such as (for heating, water supply and waste water treatment etc.) aeration blower, induced draft fan, draft blower, pressure pump, hot water circulating pump, sewage pump, water purifying pump, lift pump, water supply pump and reclaimed water pump etc.

Light industry and chemical industry

— Such as gas blower, pressure pump, compressor, axial flow pump, water softening pump and water supply pump etc.





Product features

Adapted to rigid environment

- Smooth operation at ambient temperature -5 to 40 °C without capacity reduction (derating);
- Excellent heat dissipation design, advanced S-shape air duct, long-life, large airflow cabinet-roof fans, and air intake filters that feature low wind resistance, strong dust-proof capability and easy disassembly;
- Superior power network adaptability that enables the drive to work without stop under +15~-25% of rated voltage;
- Coated circuit board that resists rigid environment;
- With super large margin design the power units can be designed and operated under 120% of load. All electronic components are designed and evaluated with 90% derating according to national standards.

Adapted to rigid environment

- Perfect input at the grid side without harmonics. Harmonics control and suppression device not required;
- Efficiency of the complete VFD is above 96%;
- HV-HV structure directly outputs 6kV or 10kV voltage. No request is needed to modify the motors ;
- Forward/reverse rotation speed tracking and restart function is particularly applicable to such load as fans.

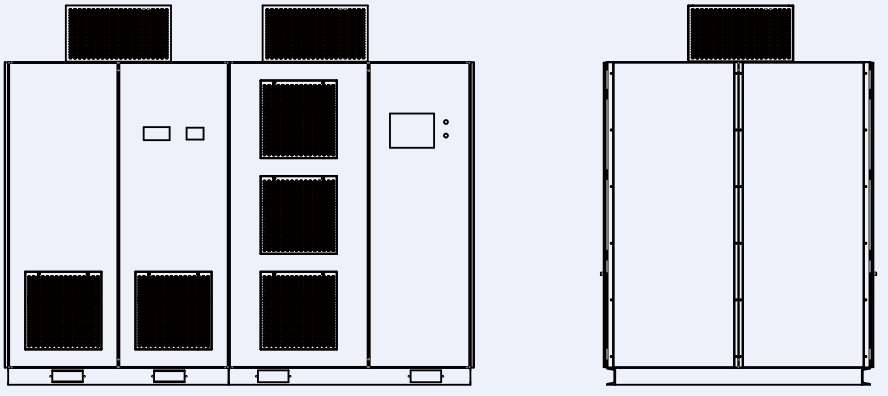
Prominent features

- The product offers three kinds of control modes: V/F, vector control with PG, vector control without PG;
- Multifunctional self-adaptive V/F feature ensures maximum start torque;
- DSP + Field Orientation Control (FOC) technology ensures optimum dynamic features;
- CAN bus communication torque distribution control is applicable to mulitmachine reconnection;
- Precise inverter nonlinear compensation acquires good low speed features;
- Neutral point drifting technology ensures maximum output power and reduction of power during bypass running of the power cells;
- Power cell automatic bypass technology;
- Perfect fault self-diagnosis and self-repairing ability;
- Power grid gapless synchronous switching;
- Restart-after- power failure function, speed search and speed tracking restart.

High quality after-sales service

- RENLE offers rapid one-stop service to customers during the service life of the equipment;
- Suggestion and tracking from specification establishment to aftersales services;
- RENLE’ s service network is all over China.

Product outer dimensions and parameters



Transformer cabinet Power cell and control cabinet Cabinet side

Outline diagrams of transformer cabinet and control cabinet

6kV MV VFD configuration table

Voltage degree	Model	Power (KW)	Capacity of transformer (KVA)	Output current (A)	Dimensions of VFD	Note
6KV	RNHV-A6/250	250	315	30	2450x1550x1800	6 power cells at every phase are adopted for altitude ≥ 1500m.
	RNHV-A6/280	280	355	35		
	RNHV-A6/315	315	400	40		
	RNHV-A6/355	355	450	45		
	RNHV-A6/400	400	500	50		
	RNHV-A6/450	450	560	55		
	RNHV-A6/500	500	630	60		
	RNHV-A6/560	560	710	65		
	RNHV-A6/630	630	800	80	3250x1650x2150	
	RNHV-A6/710	710	900	90		
	RNHV-A6/800	800	1000	100		
	RNHV-A6/900	900	1120	110		
	RNHV-A6/1000	1000	1250	120		
	RNHV-A6/1120	1120	1400	140		
	RNHV-A6/1250	1250	1600	155		
	RNHV-A6/1400	1400	1800	180	5644x1400x2670	
	RNHV-A6/1600	1600	2000	200		
	RNHV-A6/1800	1800	2240	220		
	RNHV-A6/2000	2000	2500	240		
	RNHV-A6/2240	2240	2800	270		
	RNHV-A6/2500	2500	3150	310	6844x1500x2870	
	RNHV-A6/2800	2800	3550	340		
	RNHV-A6/3150	3150	4000	380		
	RNHV-A6/3550	3550	4500	430		
	RNHV-A6/4000	4000	5000	480		

Note: The dimensions of VFD mentioned above are only for reference. The actual dimensions are regulated in the technical agreement.

10kV MV VFD configuration table

Voltage degree	Model	Power (KW)	Capacity of transformer (KVA)	Output current (A)		
10KV	RNHV-A10/315	315	400	25	2765x1550x1900	
	RNHV-A10/400	400	500	30		
	RNHV-A10/450	450	560	35		
	RNHV-A10/500	500	630	40		
	RNHV-A10/560	560	700	45		
	RNHV-A10/630	630	800	50		
	RNHV-A10/710	710	900	55		
	RNHV-A10/800	800	1000	60		

> To be continued

> Continuing

Voltage degree	Model	Power (KW)	Capacity of transformer (KVA)	Output current (A)	Dimensions of VFD	Note
10KV	RNHV-A10/900	900	1125	65	3572x1600x2250	9 power cells at every phase are adopted for altitude ≥ 1500m
	RNHV-A10/1000	1000	1250	75		
	RNHV-A10/1120	1120	1400	85		
	RNHV-A10/1250	1250	1600	95		
	RNHV-A10/1400	1400	1750	105		
	RNHV-A10/1600	1600	2000	120		
	RNHV-A10/1800	1800	2250	135		
	RNHV-A10/2000	2000	2500	145		
	RNHV-A10/2240	2240	2800	170	6644x1400x2670	
	RNHV-A10/2500	2500	3150	190		
	RNHV-A10/2800	2800	3500	210		
	RNHV-A10/3150	3150	4000	230	6894x1400x2670	
	RNHV-A10/3550	3550	4450	260		
	RNHV-A10/4000	4000	5000	300		
	RNHV-A10/4500	4500	5600	330	8802x1500x2870	
	RNHV-A10/5000	5000	6300	370		
	RNHV-A10/5600	5600	7000	410	9302x1700x3015	
	RNHV-A10/6300	6300	8000	460		
	RNHV-A10/7100	7100	9000	500		

Note: The dimensions of VFD mentioned above are only for reference. The actual dimensions are regulated in the technical agreement.

Product’s technical parameters

Name	Item	SPECIFICATION
Input	Power supply	3-phase, 6/10kV, 50/60Hz
	Input voltage range	Voltage: -15%~ +10%; Frequency: 2%
Output	Rated voltage	3-phase, 6/10kV, 50/60Hz
	Frequency range	0 ~ 120HZ
	Set resolution	0.01 HZ
	Overcurrent capacity	120% of rated output current for 1 minute; protection starts immediately under 180% of rated output current
	Control mode	V/F, vector control with PG, vector control without PG
	Synchronous switching	The VFD attains the status of grid-connected operation by following the phase and frequency of the voltage, so it realizes smooth switching from frequency conversion to working frequency without impact.
Control	Torque compensation	During start stage torque boost is realized automatically up to 150% and above
	Slip compensation	To compensate the speed drop under load and increase the hardness of mechanical characteristics

> To be continued

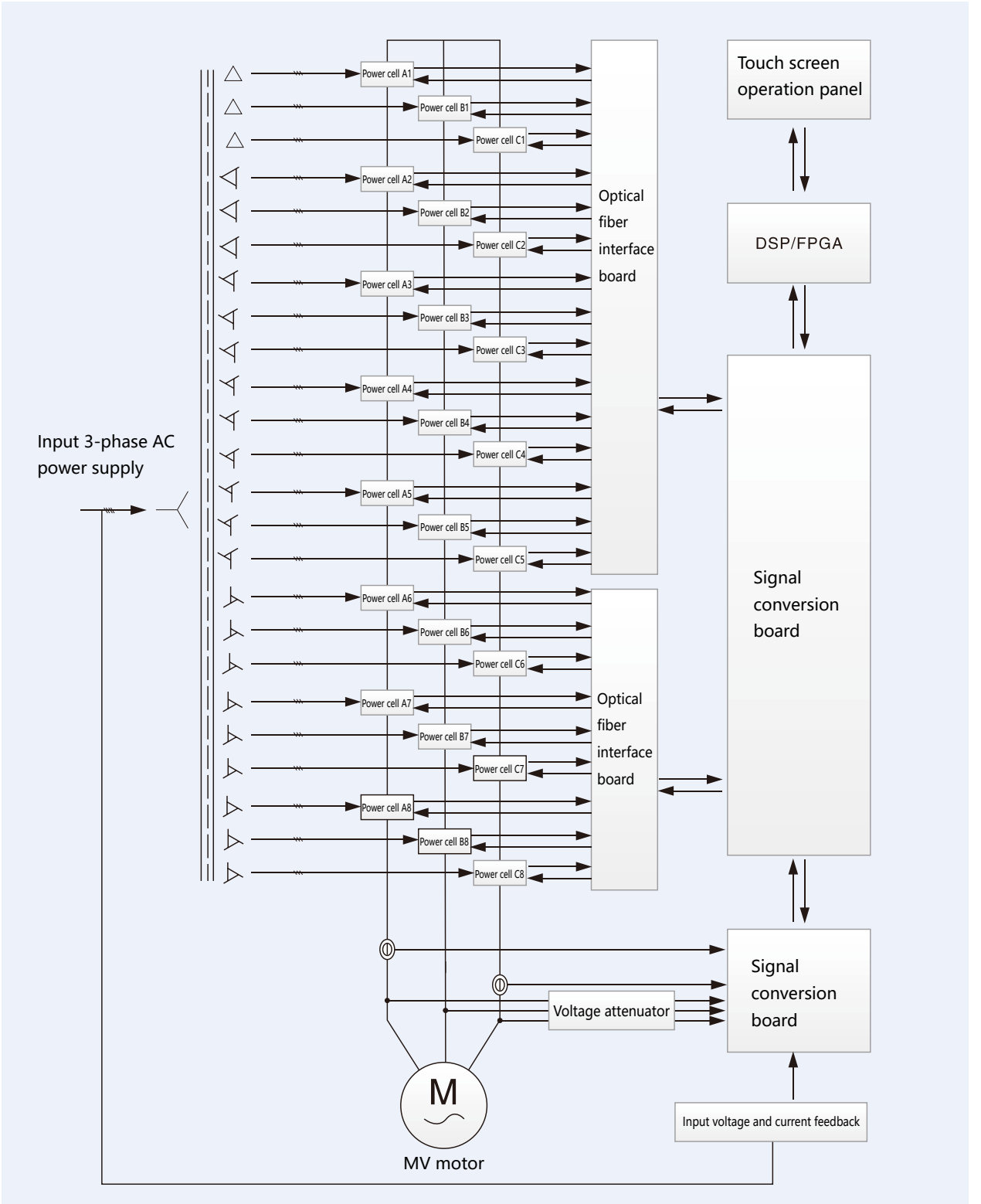
> Continuing

Name	Item	SPECIFICATION
Control	Upper and lower limits of frequency	Setting of upper and lower frequency limits is available
	Jump frequency	Setting of three groups of jump frequencies is available
	Rotation speed tracking and restart	Switching to frequency conversion mode for operation without stopping the running motor
	Acceleration and deceleration time	0.1~3600 sec. Independent setting of acceleration and deceleration time is available
	Acceleration and deceleration integral type	Linear, S1 and S2 curves are selectable to meet different application requirements
	Operation mode	Operation on the VFD, local operation, remote operation
	Stop mode	Free stop, deceleration stop and deceleration plus DC braking stop are selectable
	PID closed-loop control	Applicable to different closed-loop control systems of flow, pressure and temperature etc.
	Neutral point drifting	Any power cell can be bypassed. Through neutral point drifting technology, the 3-phase output is still balanced. In this way, maximizationof VFD' s output power is ensured after one power cell is bypassed. So when a certain power cell has fault, it can be bypass and the normal operation is not influenced.
	Automatic power cell bypass	When a certain power cell has fault, the VFD will automatically bypass the faulted power cell and continue running through the Neutral Point Drifting technology. Without manual intervention. When two or more power cells are bypassed, the user can perform derated running according to requirements.
	Restart-after- power failure	When power grid fails abruptly, the VFD can be restarted within the set time after the power is resumed. The VFD will go back to its status before power failure without manual intervention.
	Frequency setting	nalog input signal setting: setting is realized with 0~10VDC voltage signal, 0~20MA, 4~20MA current signal. Multi-frequency selection setting: selection of 1~7 frequency operation is available by combination of digital quantity input ports
	Field bus	Modbus,TCP/IP, Profibus-Dp
	Operation state output signal	Relay output: selectable to display running states of operation, stop and fault etc. Analog output: selectable to display frequency, current, voltage, rotation speed or other running parameters.
Display	During running/stop state	To display frequency, current, voltage and power
	During setting state	To display set menu number or set parameters
	During function operation state	To display prompting information of function being operated
	During alarm and fault state	To display different alarm and fault codes
Protection	Overload protection	To monitor output current of the drive to protect it when overload occurs
	Overvoltage protection	To monitor overvoltage at DV bus and input voltage of the drive for protection of the drive
	Surge voltage protection	This function protects the drive on the occasion of surge voltage among side lines of input power supply or between the lines and the earth
	Undervoltage protection	To monitor input voltage to protect the drive when undervoltage occurs
	Overheating protection	To monitor the temperature rise of the heat radiator for protection of the drive when the rise exceeds the set value
	Short circuit protection	This function protects the drive when short circuit or overcurrent occurs at the output side of the drive
	Overload protection of electric motor	To monitor the overload running of the motor for protection of it
	Phase failure protection	To monitor input voltage failure for protection of the drive
Environment	Application place	Indoors application with altitude below 1000m above the sea level; Without erosive gas and flammable gas; no dust, mist or water drop etc; No direct exposure to sunshine and no interference of strong magnetic field. The drive has to be derated at altitude over 1000m
	Temperature of application	-5℃ ~ +40℃
	Humidity of application	5 ~ 95%RH((with no frost)
	Vibration	≤0.5g
	Storage temperature	-40℃ ~ +70℃
	Protection level	IP30

Working principle and diagram

Each phase of the RNHV medium voltage drive consists of power units in series connection with the function of voltage boost through superposed wave. Every power unit is provided with independent phase-shift power by the isolation transformer. By the means of changing the quantity of series units, it is convenient to obtain output of different voltage levels. The power unit adopts AC-DC-AC method. IGBT is used as the main circuit switching element.

Working Principle Diagram of 6/10kV MV VFD



System structure of the VFD

Please refer to the diagram for the structure diagram of RNHV series MV variable speed drive. RENLE’ s MV drive consists of phase-shift transformer cabinet, power cell cabinet and control cabinet. The drive, which adopts cell module series connection and multi-level technology, is a voltage source input drive. With high reliability and easy operation features, it meets the requirement for speed control of fans and pumps etc.

Product introduction – structural composition

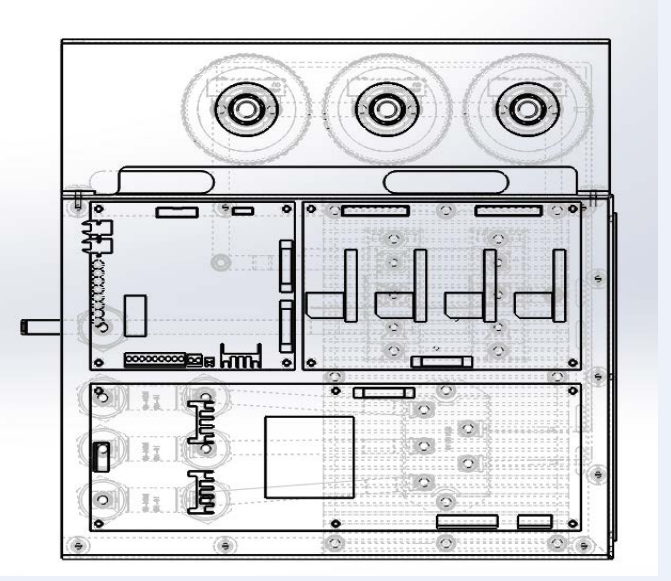
Power cell

The Power cell is a very important execution part in the MV drive. Renle’ s advanced design ideas are thoroughly embodied in the power cabinet. In order to ensure long, safe and stable running of the system, Renle is very careful in choosing every part and component in the power cabinet. Renle also devotes huge energy to production technology to ensure excellent features of the product.

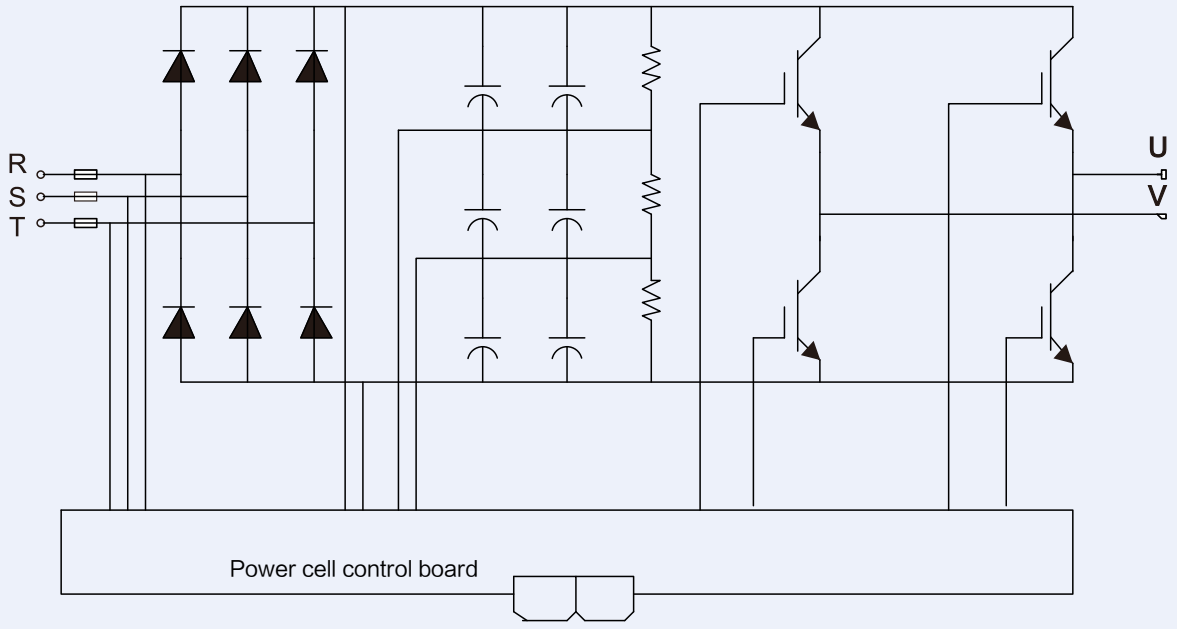
1) Power unit modularization is adopted as the design idea. Each power unit can be drawn out, moved and replaced with ease from the supporting racks. Since all power units are totally identical, if one certain power unit fails to work properly due to fault, it is applicable to replace it with a backup power unit within the time allowed for withdrawal. It takes only 5 minutes to replace a power unit with no special tool.

2) The mature Inverter technology is applied. Each power unit in the power cabinet is powered by a group of the second side of the input transformer. The power units are insulated to each other and so are the second windings of the transformer. Every power unit directly uses power devices of large power which are interchangeable to each other. The power cell is basic single phase inverter circuit and the rectifier side is diode three phase full bridge. The control mode of IGBT inverter bridge is PWM control.

3) Power unit series connection and multi-level technologies are applied. Solutions of different quantity of power units are adopted in terms of voltage levels. By mutual series connection of output terminals U and V at each power unit into star connection, the drive supplies power to the motor. PWM waveform of each power unit is recombined to provide a perfect PWM waveform with lower dv/dt, and to reduce damage to cables and motor. There is no need for output filter and the cables can be extended to a long distance according the requirement of the customer. The motor can be run without derating and the drive can be directly used for the renovation of old equipment. Meanwhile, the harmonic loss of the motor is greatly reduced, the mechanical vibration thereof is eliminated and the mechanical force of bearing and impeller is also decreased.



Power cell



Circuit diagram of the power cells

Control Cabinet

The control cabinet is the core of the whole MV frequency conversion and speed control system. All the functions of the drive are realized depending on the advanced control concept. The elaborately designed algorithm in the controller ensures optimal operation performance of the motor. The man-machine interface provides friendly English/Chinese monitoring and operation interface. In the meantime remote control and network control is realized.

1) The control cabinet consists of DSP/FPGA high-speed processor, man-machine interface and PLC etc. The man-machine interface (HMI) is a window for communication between the VFD and the user at application site. DSP/FPGA processor realizes PWM control algorithm. The man-machine interface provides connection of the drive with the site interface of the customer. The built-in PLC is employed for logic processing of the switch signals in the cabinet and can be flexibly connected to the interface at customers' site of application to meet their special requirement.

2) PLCs are adopted to process different switching value logic signals, customer' s site control system flow signals and state signals. This enables Renle' s drive to own strong system interface and communication capability which are subject to extension according the requirement of the users.

3) Optical fiber communication technology is adopted between the control cabinet and power cells. There is effective electric isolation in the low voltage and the high voltage sections. The system has high reliability, rapid communication and strong anti-electro-magnetic interference capability. The control cabinet is equipped with UPS, which ensures reliability of supply by the control power.

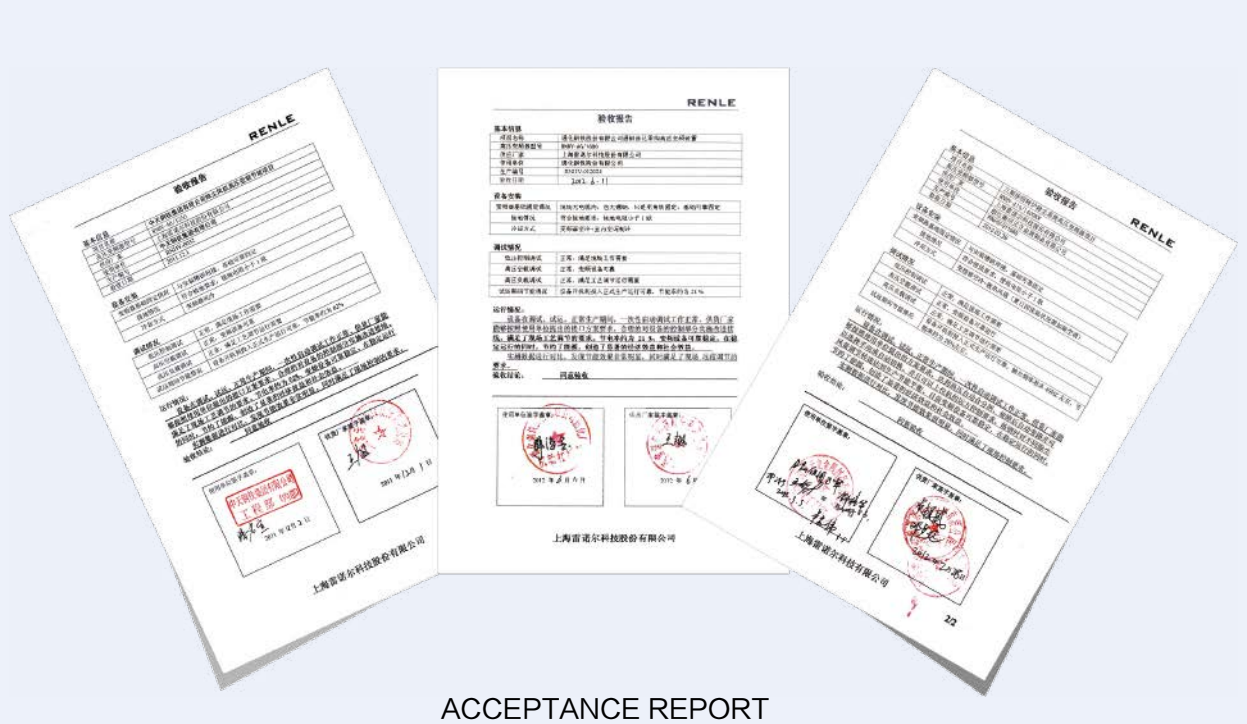
Installation, transportation and storage

- By common transportation vehicle
- Handle with care. Strictly no rain drench, violent vibration or impact during transportation
- Storage temperature: −40° C ~ +70° C
- Requirement for storage environment: No dust and corrosion and without inflammable and explosive atmosphere
- Installation requirement: Vertical installation for the cabinets

Design standard

Standard	Description
GB156-2007	Standard voltages
GB/T1980-2005	Standard frequencies
GB2681-81	Colours of insulated conductors used in electrical assembly devices
GB3797.34	Electric-driving controlgear Part 2: Electric-driving controgear incorporating electronic devices
GB3859.1-93	Semiconductor convertors - Specification of basic requirements
GB3893.2-93	Semiconductor convertors - Application guide
GB3859.3-93	Semiconductor convertors - Transformers and reactors
GB10233-2005	Basic test method for electric - driving controlgear assemblies
GB12668.3-2003	Adjustable speed electrical power drive systems Part 3: EMC product STANDARD including specific test methods
GB12668.4-2006	Adjustable speed electrical power drive systems Part 4: General requirements - Rating specifications for AC power drive systems above 1000 VAC not exceeding 35 kV
GB/T14436-93	General principles of industrial product guarantee documents
GB/T15139-94	General technical standard for electrical equipment structure
GB/T13422-92	Power semiconductor converters - Electrical test methods
GB/T14549-93	Quality of electric energy supply, harmonics in public supply network
IEEE Std-1992	Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

Several project acceptance reports



ACCEPTANCE REPORT

Several project acceptance reports

RENLE

验收报告

基本信息

项目名称	山西省金地矿业集团风机项目
高压变频器型号	HMV-A10/1250
供应厂家	上海雷诺尔科技股份有限公司
使用单位	灵丘县金宇铁合金有限责任公司
生产编号	RNHV-012023
验收日期	2012.5.27

设备安装

变频器基础固定情况	与安装槽钢相接，基础可靠固定
接地情况	符合接地要求，接地电阻小于 1 欧
冷却方式	变频器风冷

调试情况

低压控制调试	正常，满足现场工作需要
高压空载调试	正常，变频设备可靠
高压负载调试	正常，满足工艺调节运行需要
试运期间节能情况	设备开机到投入正式生产运行可靠，节能率约为 30%

运行情况：

设备在调试、试运、正常生产期间，一次性启动调试工作正常。供货厂家能够按照使用单位提出的接口方案要求，合理地对设备的控制部分实施改造接线，满足了现场工艺调节的要求。节电率约为 30%，变频设备可靠稳定，在稳定运行的同时，节约了能源，创造了显著的经济效益和社会效益。

实测数据进行对比，发现节能效果非常明显，同时满足了现场调节的要求。

验收结论：同意验收

使用单位签字盖章：

2012 年 5 月 27 日

供货厂家签字盖章：

2012 年 5 月 27 日

上海雷诺尔科技股份有限公司

Part of achievements

DatangGangu Power Plant

Datang Shandong Power Generation Technical Engineering Co., Ltd.

GuizhouHuadianTangzhai Power Generation Co., Ltd.

Hubei Xiangfan Power Generation Co., Ltd of China Huadian Corporation Ltd.

Wujiang Thermal Power Company of China Huadian Engineering (Group) Co., Ltd.

Weihai Thermal Power Group Co., Ltd.

Anhui HuadianLu'an Power Plant

Xinjiang Steel and Iron Co., Ltd of Laigang Group

Tonghua Iron & Steel Co., Ltd.

Jigang International Engineering & Technology Co., Ltd.

Shanxi Jindi Mining Co., Ltd

Alxa Yellow River High Head Irrigation Administration

ZuoyunDonggucheng Coal Co., Ltd of Shanxi Coal Imp. & Exp. Group Co., Ltd.

Xinjiang Xiyi Instrument Sales Co., Ltd.

Xinjiang Yili Biotechnology Co., Ltd.

Sichuan HuiliHengchao Mine Co., Ltd.

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National Key Projects

Three Gorges Project
Beijing Olympic Rowing-Canoeing Park
Beijing Olympic Games Supporting Projects
Beijing Wukesong Gymnasium
Government Offices Administration of the State Council
CCTV, China
Beijing Capital International Airport
South-to-North Water Diversion Project
Huangshan-Quzhou-Nanping Expressway
West-to-East Electricity Transmission Project
West-to-East Natural Gas Transmission Project
Stations of Shanghai Magnetic Levitation Rail Transportation
Expo 2010 Shanghai China Supporting Projects
Shanghai Pudong Airport
Shanghai International Automobile Museum
Shanghai Hongqiao Airport Extension Project
Terminal of Inner Mongolian Hohhot Baita International Airport Extension Project
Shenyang Olympic Center
Qingdao Olympic Center
Jinan Olympic Center
Chengdu Shuangliu International Airport Extension Project
Chongqing Yuanjiagang Olympic Sports Center
Guangzhou New Baiyun International Airport
Wuhan Tianhe Airport
Shanghai Metro Line 3
Chongqing International Convention & Exhibition Center
Shanxi Wanjiazhai Yellow River Diversion Project
Qinghai Xiaoyou Mountain Ecological Engineering
Tianjin Eight Large Regions Heating Engineering
Shandong Heze City Yellow River Diversion Project
Yangshan Deepwater Port Project of Shanghai International Shipping Center
Sichuan Xichang Satellite Launching Center

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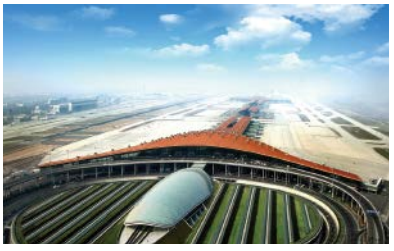

Guangxi Longtan Hydroelectric Project
Gansu Satellite Launching Center
Yunnan Honghe River Nansha Hydropower Station
Datang International Power Generation Co., Ltd.
Guizhou Kailin (Group) Co., Ltd
Inner Mongolian Shenhua Group Corporation Limited
Shanghai Petrochemical Company Limited
Baosteel Group Corporation in Shanghai
Taizhou Petrochemical Co., LTD
Anshan Iron and Steel Group Corporation
Jilin Petrochemical Company
Wuhan Iron and Steel (Group) Corp.
Liuzhou Chemical Industry Co., Ltd, Guangxi
Beijing Shougang Company Limited
SINOPEC Cangzhou Company
China Great Wall Aluminum Corporation
SINOPEC Luoyang Company
Guangxi PingguoAluminium Company
Yueyang Petrochemical Factory
Liuzhou Iron and Steel Co., Ltd
Sinopec Nanjing Chemical Industry Co., Ltd
Magang (Group) Holding Company Ltd
SINOPEC Beijing Yanshan Company
Shanxi Zhongyang Iron and Steel Co., Ltd.
PetroChina Urumqi Petrochemical Company
Daqing Oilfield Limited Company
PetroChinaJinxi Petrochemical Company
SINOPEC Shenli Oilfield
CNPC Dushanzi Petrochemical Company
PetroChinaLiaohe Oilfield
Beijing Financial Street
PetroChinaTarim Oilfield
Panda Museum of Chengdu Panda Ecological Park
Karamay Oilfield
Qingdao Beihai Shipyard
PetroChinaChangqing oilfield