

ZINVERT智能高压变频调速系统产品手册

ZINVERT Intelligent High-voltage Variable Frequency Device
Product Brochure



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一、公司简介

Company Introduction

广州智光电气技术有限公司是广州智光电气股份有限公司在综合能源技术与服务战略发展方向专业从事柔性电力技术研究的核心成员企业。

公司自成立以来一直专注于以大功率电力电子为核心技术的电气控制装备技术研究,在智能电网、分布式微网、储能、电机控制与节能、电能质量控制、先进电源技术等开展技术研究与产业化应用。主营产品包括配网中性点接地装置、高压变频调速装置、储能PCS系统、静止无功发生装置(SVG)、港口岸电系统、高/低压电能治理及大型工业智慧型UPS等。

Guangzhou Zhiguang Electric Technology Co., Ltd. is a core member enterprise of Guangzhou Zhiguang Electric Co., Ltd. specializing in the research of flexible power technology in the strategic development direction of integrated energy technology and services.

Since its establishment, the company has been focusing on the research of electrical control equipment technology with high-power power electronics as the core technology, and has carried out technological research and industrial application in the fields of smart grid, distributed microgrid, energy storage, motor control and energy conservation, power quality control, advanced power supply technology, etc. The main products include neutral point grounding devices for distribution networks, high-voltage variable frequency speed regulation devices, energy storage PCS systems, static var generators (SVG), port shore power systems, high/low-voltage power quality management, and large industrial intelligent UPS, etc.



“大功率电力电子技术创新专家”
An Expert in Technological Innovation
of High-power Electronics.



“帮助客户安全、高效、舒适地使用能源”
To Help Customers Use Energy Safely, Efficiently
and Comfortably.

2002 年

成立时间
Establishment Time: 2002

2亿元

注册资金
Registered Capital: 200 million yuan

002169

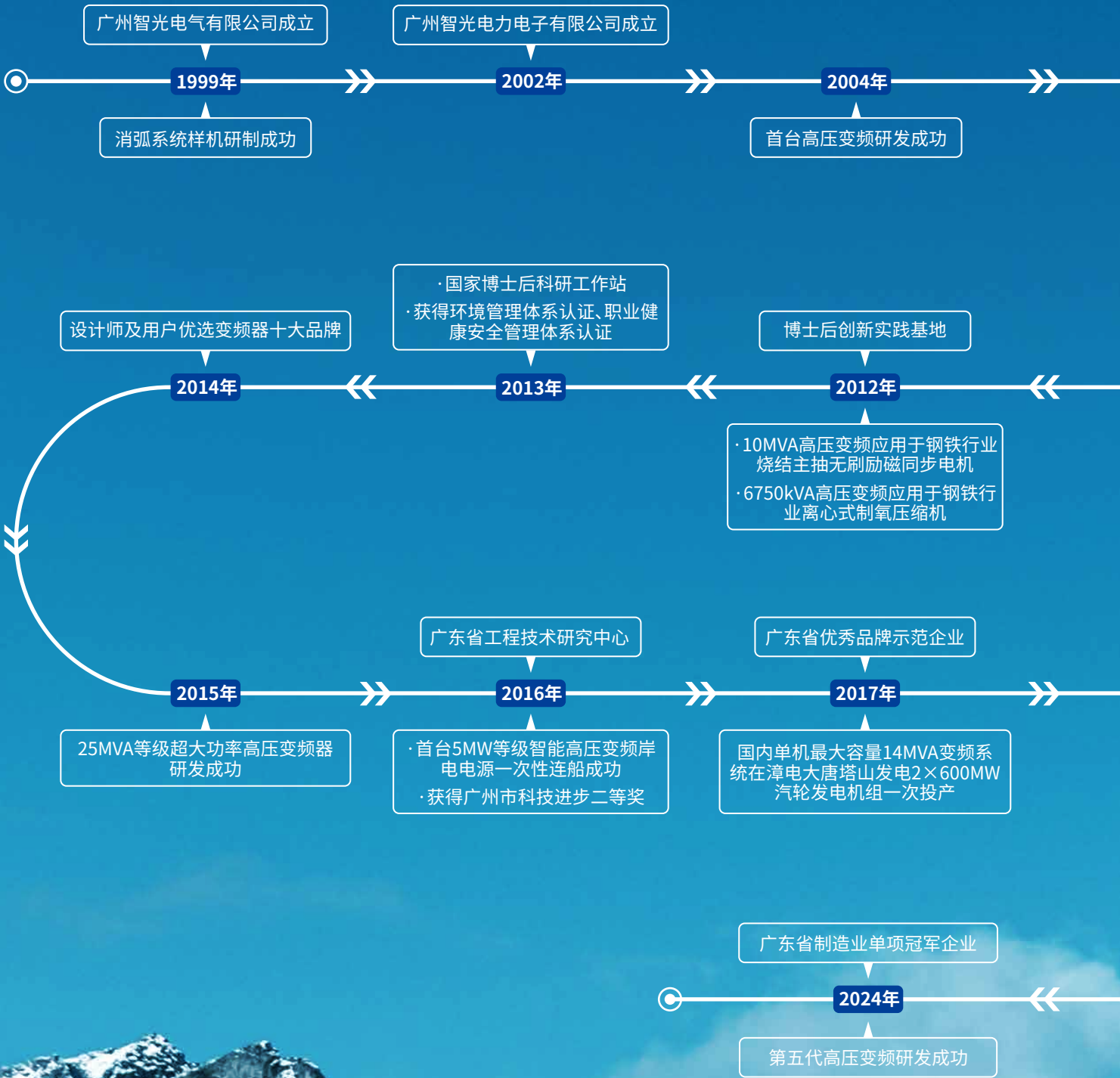
智光电气股份全资子公司
Wholly-owned subsidiary of Zhiguang
Electric Co., Ltd.

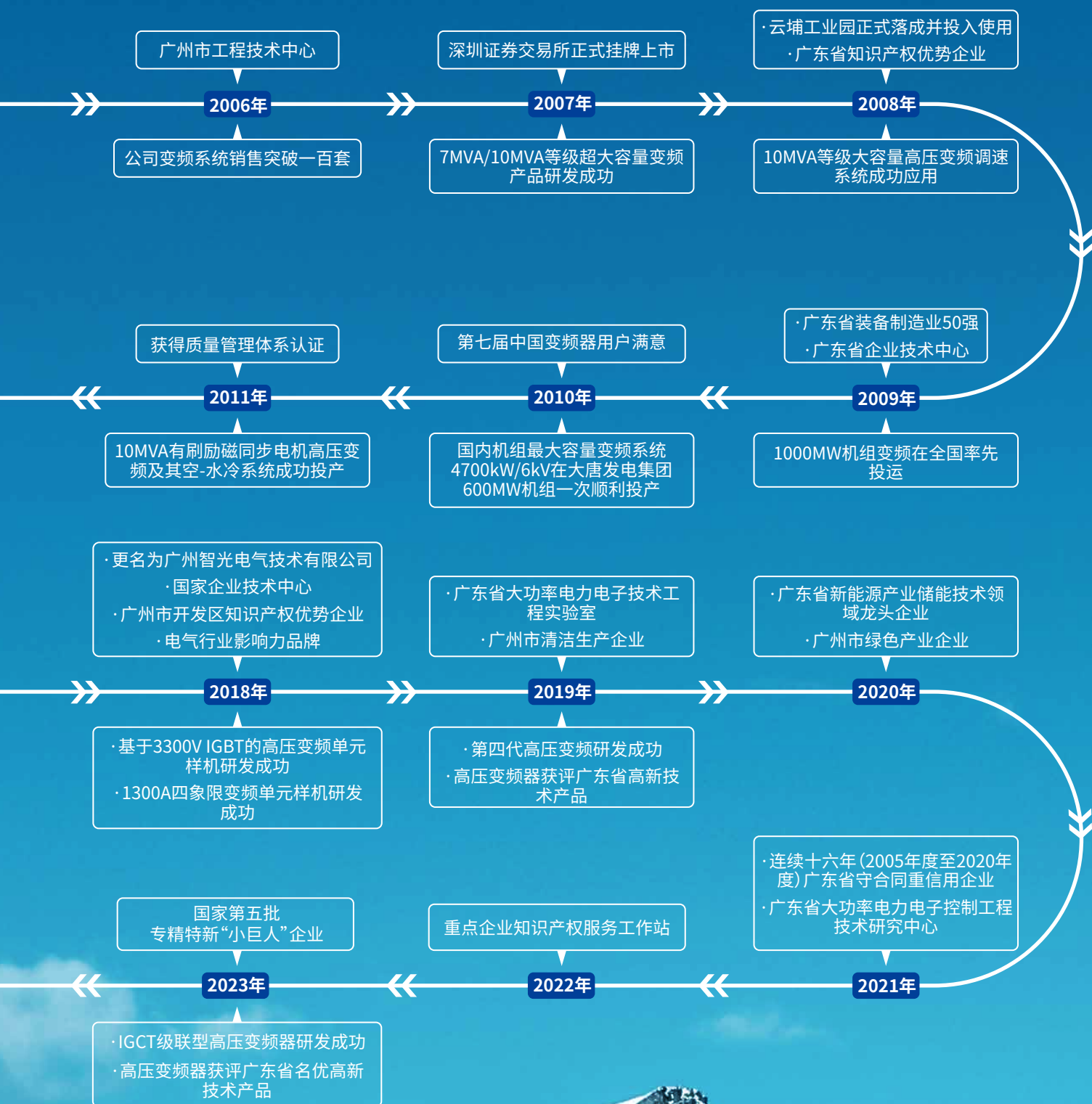
300+ 项

专利及荣誉资质
More than 300 patents and honorary
qualifications

1.1企业及产品发展历程

Development History of Enterprises and Products





二、产品介绍 Product Introduction



2.1 ZINVERT智能高压变频调速系统介绍

ZINVERT Intelligent High-voltage Variable Frequency Device(HVFD) Introduction

ZINVERT智能高压变频调速系统通过移相变压器对输入的10kV或6kV电压进行移相降压后,由功率单元整流逆变并每相叠加后输出,实现真正高-高变频调速控制。

HVFD through the phase shifting transformer on the input 10kV or 6kV voltage after phase shifting step-down, by the power unit rectifier inverter and superposition of each phase after the output, to achieve the real high-high frequency conversion speed control.

- 高功率密度一体柜型, 机箱式功率单元, 适于**单人维保**操作;
High power density all-in-one cabinet type, chassis type power unit, suitable for single person maintenance operation;
- 先进的转速追踪算法, **实时监测机组**运维, 保证全工况快速启动;
Advanced speed tracking algorithm, real-time monitoring of unit operation and maintenance, to ensure rapid start-up in full working conditions;
- 优化的全系统逻辑控制策略, 为高压失电后**快速重启**保驾护航;
Optimised system-wide logic control strategy, which ensures fast restart after high voltage loss;
- 严谨的热分析设计, 既**保证散热**又极大地**减少**安装空间及**基建成本**;
Rigorous thermal analysis design, which not only ensures heat dissipation but also greatly reduces installation space and infrastructure costs.
- 采用**多级H桥功率**单元箱级联的方式实现了高压的完美波形输出, 无需升压即可直接拖动普通异步电动机;
Adopting multi-stage H-bridge power unit box cascade to realise the perfect waveform output of high voltage, it can directly drag ordinary asynchronous motor without boosting.
- 无需加装任何滤波器, 谐波指标严格符合IEC及国标对电网谐波最为严酷的要求。
Without adding any filter, and the harmonic index meets the most severe requirements of IEC and national standard on grid harmonics.



2.2 ZINVERT智能高压变频调速系统八大优势

HVFD Eight Advantages



优异的高低电压穿越技术

Superior high and low voltage ride-through technology

在网侧电压65%~115%U_e范围波动不停机,在网侧电压掉电60s内,自行无冲击启动,并将电机拖动至掉电前状态。It does not shut down in the range of 65% to 115% U_e fluctuation of the grid-side voltage, and within 60s of the grid-side voltage dropout, it starts by itself without shock and drags the motor to the state before the power dropout.



采用专有“STT”技术实现旋转负载直接启动

Direct starting of rotating loads with proprietary "STT" technology

采用独创的“STT”算法,确保电机在调速范围内的任何转速下,无需停止即可直接无冲击启动,通过国家机构的试验验证。Adopting the original "STT" algorithm, it ensures that the motor can be started without stopping at any speed within the speed range, and can be started directly without impact, which has been verified by the test of the national organisations.



高压输出突发短路“SCP”防护技术

High-voltage output sudden short-circuit "SCP" protection technology

采用多重短路保护功能的“SPC”防护专利技术,可有效保护电机及系统的安全性。Adopting the patented "SPC" protection technology with multiple short-circuit protection functions, it can effectively protect the safety of the motor and the system.



高短路绝缘阻抗变压器单独供电技术

Separate power supply technology for transformers with high short-circuit insulation impedance

低压调试模式,调试方便,问题排查简便,缩短调试周期,提高可靠性。Low-voltage debugging mode enables convenient debugging and easy problem troubleshooting, shortens the debugging cycle, and improves reliability.



自适应加减速调节

Adaptive acceleration and deceleration adjustment

采用加减速自适应技术,有效的解决了变负荷下加、减速时间的自适应控制,充分利用电流过负载裕度和直流过电压裕度,实现加减速最快。Improve the short-circuit resistance of the transformer, guarantee the stability of the power supply of the unit, reduce the losses generated by daily operation, and save energy and increase efficiency.



独特的散热结构适应风冷水冷柔性设计

Unique cooling structure adapts to air-cooled and water-cooled flexible design

采用特殊的结构设计,散热效率高,系统体积小,对温度、湿度、粉尘、气体等环境要求较低,风冷、水冷满足多场景客户需求。Adopting special structural design, high heat dissipation efficiency, small system volume, low requirements for temperature, humidity, dust, gas and other environmental requirements, air-cooled, water-cooled to meet the needs of customers in multiple scenarios.



电源敏感性低,运行稳定性强

Low power sensitivity and high operational stability

采用三路供电回路设计,对电源敏感性低。采用软硬件多重抗干扰技术,保障系统运行的稳定性。Adopt three-way power supply circuit design, low sensitivity to power supply. Adopt software and hardware multiple anti-interference technology to ensure the stability of system operation.



整机自研自产保障质量成本竞争力

The whole machine is self-developed and produced to ensure quality and cost competitiveness.

基于智光多年大功率电力电子技术及专利技术,自研自产功率单元体、移相变压器、控制系统等核心部件,保障产品质量及成本优势。Based on Zhiguang's many years of high-power electronics technology and patented technology, self-developed and produced of power units, phase-shifting transformers, control systems and other core components, to ensure product quality and cost advantages.

2.3 主要性能指标

Main performance indicators

电压等级 voltage	2.3kV, 3kV, 3.3kV, 6kV, 6.6kV, 10kV	
输出 output	过载能力 overload capacity	130%In 1min/10 min; 180%In立即保护; 130% In 1 min/10 min; 180% In immediate protection;
	电压 voltage	0~Un (额定电压), 载波移相叠加波形 Carrier phase-shifted superimposed waveform
	频率 frequency	0~50Hz/60Hz
	电流谐波THD	<2% (额定功率rating)
输入 input	相数、频率 phases, frequency	三相three-phase、50/60±5%Hz
	电压范围 voltage range	(正常运行rating)/-15%~35% (降额运行reduced rate)
	功率因数 power factor	>0.96 (大于20%负荷Greater than 20% load)
控制 control	启动频率 Startup frequency	0.1~10Hz (可设定)
	输入/输出接口 Input/Output Interface	标准: 数字量输入/输出各16路; 模拟量输入1路, 输出5路 Standard: 16 digital inputs/outputs each; 1 analogue input, 5 outputs
	通讯接口 communication interface	RS232, RS485, RJ45
	信号隔离方式 Signal isolation	光电隔离 opto-isolation
	精度 accuracy	频率稳定精度0.1%; 电压精度±2% Frequency stability accuracy 0.1%; voltage accuracy ± 2%
	效率 efficiency	>97% (额定负载rated); >96% (大于20%额定负载>20% rated)
	转矩提升 torque increase	0~10%Un (可设定configurable)
	加减速时间 acceleration and deceleration times	0~3000s (可设定configurable)
	瞬时掉电再启动 Instant power-down and restart	再启动方式可选, 等待时间0.1~30s (可设定) Restart mode optional, waiting time 0.1~30s (settable)
	内置PLC整定 Built-in PLC calibration	PID参数手动/自动整定 Manual/automatic adjustment of PID parameters
显示 display	触控式人机界面 Touch-sensitive human-machine interface	实时数据, 设备状态、参数设定 Real-time data, device status, parameter settings
保护功能 protective function	过流、短路、接地、过压、欠压、过载、过热、电动机过载、缺相、IGBT击穿或短路、单元故障、高低电压穿越等 Over-current, short-circuit, grounding, over-voltage, under-voltage, overload, overheating, motor overload, phase loss, IGBT breakdown or short-circuit, unit fault, high and low voltage ride-through, etc.	
故障切换 failover	系统旁路、单元旁路 System bypass, unit bypass	
噪声 noise	<75dB (总噪声all)	
环境要求 environment	使用场所 location	室内: 海拔5000m以下 (标准海拔1200米, 1200-5000米需定制) 室外: 预制舱式 无腐蚀性、爆炸性气体、灰尘, 无阳光直射。 Indoor: up to 5000m above sea level (standard 1200m above sea level, customised for 1200-5000m) Outdoor: prefabricated cabin No corrosive, explosive gas, dust, no direct sunlight.
	温度/湿度 temperature/humidity	温度: -5~+45°C; 湿度: 20~95%, 无凝露 Temperature: -5 to +45°C; Humidity: 20 to 95%, no condensation
	振动 vibration	10~150HZ, 0.5g以下
	存放条件 storage	-20~70°C
冷却方式 cooling method	强迫风冷、水冷、空水冷 Forced air, water and evaporative cooling	

2.4 商业模式 Business Models

2.4.1 应用场景 Application Scenarios

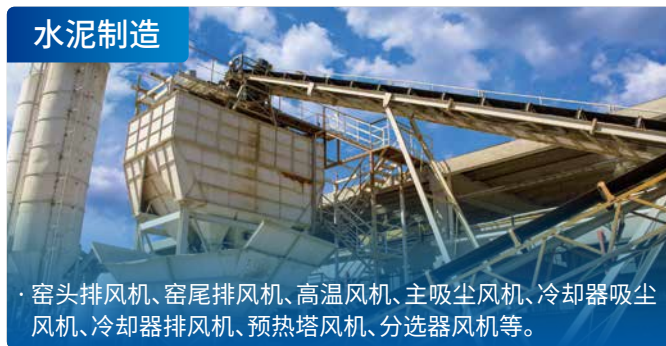
火力发电



· 引风机、送风机、吸尘风机、增压风机、压缩机、凝结水泵、给水泵、补水泵、灰浆泵等。

Thermal power generation: induced draft fan, supply fan, dust-absorbing fan, booster fan, compressor, condensate pump, feed water pump, make-up water pump, grey slurry pump, and so on.

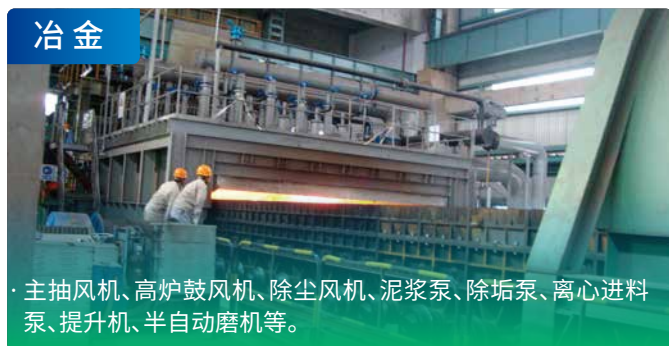
水泥制造



· 窑头排风机、窑尾排风机、高温风机、主吸尘风机、冷却器吸尘风机、冷却器排风机、预热塔风机、分选器风机等。

Cement manufacturing: kiln head exhaust fan, kiln tail exhaust fan, high-temperature fan, main dust-absorbing fan, cooler dust-absorbing fan, cooler exhaust fan, preheating tower fan, sorter fan, etc.

冶金



· 主抽风机、高炉鼓风机、除尘风机、泥浆泵、除垢泵、离心进料泵、提升机、半自动磨机等。

Metallurgy: main extractor fan, blast furnace blower, dust removal fan, slurry pump, descaling pump, centrifugal feed pump, elevator, semi-automatic mill, etc.

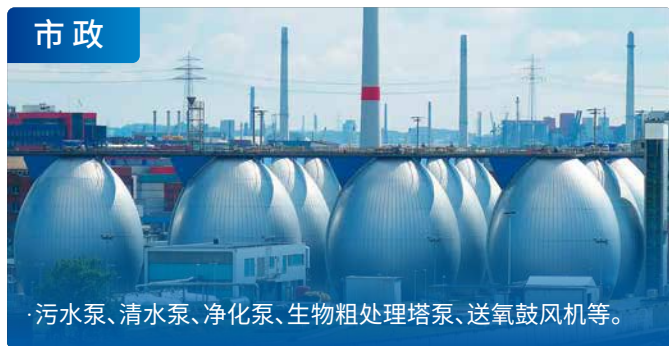
矿山



· 主通风机、压风机、抽风机、空气压缩机、抽水泵、皮带机、碾压机等。

Mines: Main ventilation fans, pressurised fans, extractor fans, air compressors, pumps, belt conveyors, mills, etc.

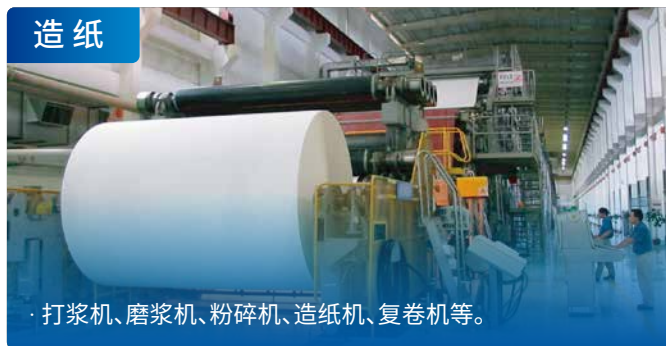
市政



· 污水泵、清水泵、净化泵、生物粗处理塔泵、送氧鼓风机等。

Municipalities: sewage pumps, clean water pumps, purification pumps, biological crude treatment tower pumps, oxygen delivery blowers, etc.

造纸



· 打浆机、磨浆机、粉碎机、造纸机、复卷机等。

Papermaking: pulper, grinder, pulveriser, papermaking machine, rewinder, etc.

石油化工



· 引风机、气体压缩机、注水泵、潜油泵、主管道加压机、锅炉给水泵、卤水泵、混合器、挤压器等。

Petrochemical: induced draft fan, gas compressor, water injection pump, submersible oil pump, main pipeline pressurised pump, boiler feed pump, brine pump, mixer, squeezer, etc.

其它



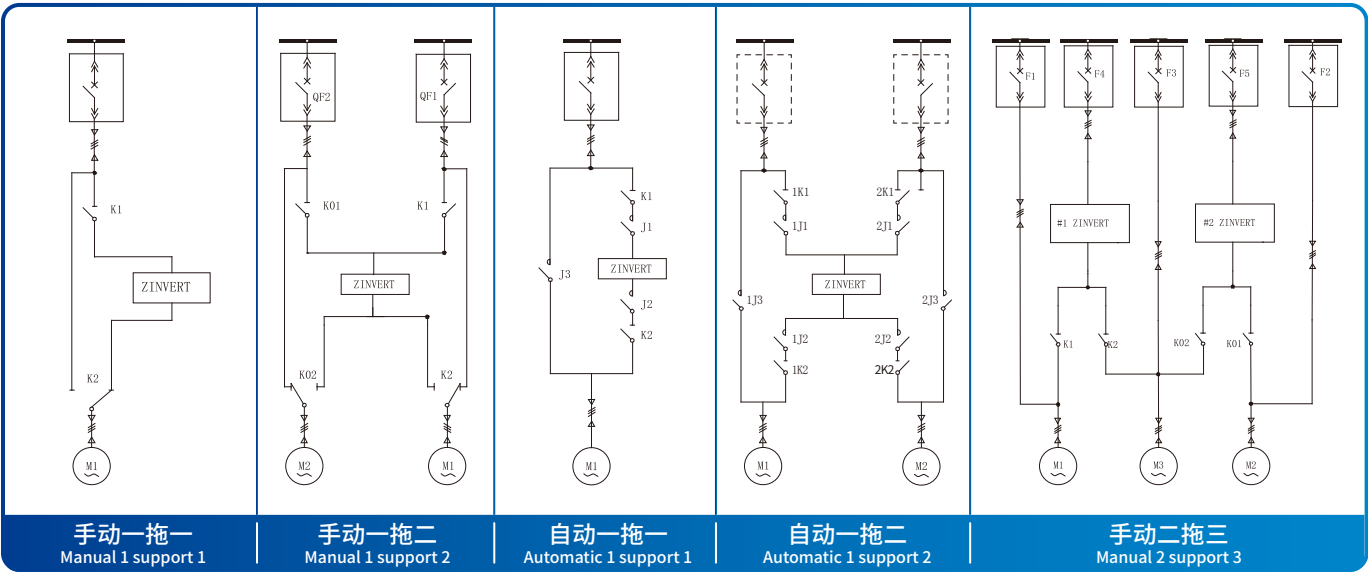
· 同步皮带传动机械装置、矿井提升机、风力涡轮机、能量回馈实验室、拖动控制、风洞、橡胶、军工等行业。

Others: Synchronous belt drive mechanical devices, mine hoist, wind turbine, energy return laboratory, drag control, wind tunnel, rubber, military and other industries.

2.4.2 解决方案 Solution

经过多年现场实践和应用, 智能高压变频调速系统具备如下成熟的商业化系统应用方案:
After years of on-site practice and application, the HVFD has the following mature commercial system application solutions:

- 1.手动一拖一: 适合于对工变频切换速度不高的负载。
Manual 1 support 1: suitable for the industrial frequency conversion switchingspeed is not high load.
- 2.手动一拖二: 适合于具有两台电机一用一备的现场, 如火力发电厂的凝结水泵等。正常运行时一台变频运行, 一台工频备用。
Manual 1 support 2: suitable for two motors with a standby site, such as thermal power plant condensate pumps and so on.
- 3.自动一拖一: 适合于需要工变频快速切换的负载。 Automatic 1 support 1: suitable for two motors with a standby site, such as power thermal plant condensate pumps and so on.
- 4.自动一拖二: 适合于具有两台电机一用一备的现场, 如火力发电厂的凝结水泵等。正常运行时一台变频运行, 一台工频备用, 当需要对变频进行维护或倒泵运行时, 可快速进行工变频切换。 Automatic 1 support 2: suitable for the site with two motors with one standby, such as condensate pumps in thermal power plants. Normal operation of a frequency conversion operation, a frequency standby, when the need for frequency conversion maintenance or reverse pump operation, can quickly switch between frequency conversion.
- 5.手动二拖三: 适合于具有三台电机且两用一备或一用两备的现场, 一般对可靠性要求较高, 如钢铁厂高炉鼓风机或火力发电厂电动给水泵等。正常情况运行时两台电机变频运行, 当一台变频突发异常时备用风机(泵) 紧急启动可保证生产连续进行, 变频维护完毕后顺利切换。
Manual 2 support 3: suitable for three motors and two with a standby or a two standby site, generally higher reliability requirements, such as iron and steel plant blast furnace blower or thermal power plant electric feed pumps and so on. Normal operation of the two motors frequency conversion operation, when a frequency conversion sudden abnormality standby fan (pump) emergency start to ensure continuous production, frequency conversion maintenance can be switched smoothly after completion.



2.5 选型表

► 型号说明

Zinvert-□□H·XXXXX/XX

- 电压等级: 06表示6kV系列 10表示10kV系列
- 额定容量: 单位kVA
- H 桥级联
- 功率单元级数: 每相功率单元个数
- 产品应用对象: A表示适用异步电机
- 广州智光电气技术有限公司高压变频调速系统

► 10kV高压变频系统选型表 10kV HVFD Selection Table

序号 NO.	电机容量 Motor Capacity	变频器型号 Inverter Model	额定输出 电流 (A) Rated output current	总长度 Total Length		高度 Height	总深度 Total Depth	总重 (kg) Total Weight	
	(kW)			手动 Manual	自动 Automatic	(mm)	(mm)	手动 Manual	自动 Automatic
1	315	Zinvrt-A8H400/10	30	2400	3000	2810	1384	2670	2970
2	355	Zinvrt-A8H450/10	30	2400	3000	2810	1384	2720	3020
3	400	Zinvrt-A8H500/10	30	2400	3000	2810	1384	2770	3070
4	450	Zinvrt-A8H560/10	36	2400	3000	2810	1384	2867	3167
5	500	Zinvrt-A8H630/10	36	2400	3000	2810	1384	2967	3267
6	560	Zinvrt-A8H700/10	50	2400	3000	2810	1384	3067	3367
7	630	Zinvrt-A8H800/10	50	2400	3000	2810	1384	3117	3417
8	710	Zinvrt-A8H900/10	60	2400	3000	2810	1384	3284	3584
9	800	Zinvrt-A8H1000/10	60	2400	3000	2810	1384	3384	3684
10	900	Zinvrt-A8H1150/10	75	2400	3000	2810	1384	4098	4398
11	1000	Zinvrt-A8H1250/10	75	2400	3000	2810	1384	4348	4648
12	1120	Zinvrt-A8H1400/10	105	2400	3000	2810	1384	4455	4755
13	1250	Zinvrt-A8H1500/10	105	2400	3000	2810	1384	4545	4845
14	1400	Zinvrt-A8H1750/10	105	2400	3000	2810	1384	4745	5045
15	1500	Zinvrt-A8H1800/10	105	2400	3000	2810	1384	5050	5350
16	1600	Zinvert-A8H2000/10	120	3400	4000	2675	1695	5340	5726
17	1800	Zinvert-A8H2250/10	150	3400	4000	2675	1695	5840	6226
18	2000	Zinvert-A8H2500/10	150	3400	4000	2675	1695	6206	6530
19	2250	Zinvert-A8H2800/10	180	3400	4000	2675	1695	6530	6960
20	2500	Zinvert-A8H3100/10	180	3400	4000	2675	1386	8654	8954
21	2800	Zinvert-A8H3500/10	216	5700	6300	2675	1386	9428	9728
22	3000	Zinvert-A8H3750/10	216	5700	6300	2675	1386	9928	10228
23	3150	Zinvert-A8H4000/10	250	5700	6300	2675	1386	10144	10444
24	3550	Zinvert-A8H4500/10	250	5900	6500	2675	1386	10814	11114
25	4000	Zinvert-A8H5000/10	270	5900	6500	2675	1386	12158	12458
21	4500	Zinvert-A8H5600/10	300	5900	6500	2710	1386	12959	13259
22	5000	Zinvert-A8H6300/10	360	6100	6700	2910	1386	13358	13658
23	5400	Zinvert-A8H6750/10	400	6100	6700	2910	1386	14358	14658
24	6300	Zinvert-A8H7800/10	480	9680	10280	2910	1586	16027	16327
25	7200	Zinvert-A8H8900/10	540	11400	13000	2910	1586	18960	20460
26	8000	Zinvert-A8H10000/10	600	11400	13000	2910	1586	22930	24430
27	9000	Zinvert-A8H11250/10	720	11400	13000	2910	1586	24130	25630
28	10000	Zinvert-A8H12500/10	720	11400	13000	2910	1586	25830	27330
29	11200	Zinvert-A8H14000/10	810	14400	16000	2910	1586	25830	27330
30	12500	Zinvert-A8H15500/10	900	14400	16000	2910	1586	27430	28130
31	14000	Zinvert-A8H17500/10	1050	15210	16810	2910	1586	32630	31130

► 6kV高压变频系统选型表 6kV HVFD Selection Table

序号 NO.	电机容量 Motor Capacity	变频器型号 Inverter Model	额定输出 电流 (A) Rated output current	总长度 Total Length		高度 Height	总深度 Total Depth	总重 (kg) Total Weight	
	(kW)			手动 Manual	自动 Automatic	(mm)	(mm)	手动 Manual	自动 Automatic
1	220	Zinvert-A6H280/06	30	2400	3000	2810	1384	2370	2670
2	250	Zinvert-A6H315/06	30	2400	3000	2810	1384	2370	2670
3	280	Zinvert-A6H350/06	35	2400	3000	2810	1384	2440	2740
4	315	Zinvert-A6H400/06	50	2400	3000	2810	1384	2524	2824
5	355	Zinvert-A6H450/06	50	2400	3000	2810	1384	2664	2964
6	400	Zinvert-A6H500/06	50	2400	3000	2810	1384	2831	3131
7	450	Zinvert-A6H560/06	60	2400	3000	2810	1384	2911	3211
8	500	Zinvert-A6H630/06	60	2400	3000	2810	1384	3281	3581
9	560	Zinvert-A6H700/06	75	2400	3000	2810	1384	3348	3648
10	630	Zinvert-A6H800/10	105	2400	3000	2810	1384	3445	3745
11	710	Zinvert-A6H900/10	105	2400	3000	2810	1384	3545	3845
12	800	Zinvert-A6H1000/10	105	2400	3000	2810	1384	3765	4065
13	900	Zinvert-A5H1150/06	120	3000	3600	2675	1695	6106	6486
14	1000	Zinvert-A5H1250/06	120	3000	3600	2675	1695	6586	6966
15	1120	Zinvert-A5H1400/06	150	3000	3600	2675	1695	6766	7146
16	1250	Zinvert-A5H1550/06	150	3000	3600	2675	1695	6766	7146
17	1400	Zinvert-A5H1800/06	180	3000	3600	2675	1695	6766	7146
18	1600	Zinvert-A5H2000/06	216.5	3800	4400	2675	1586	5930	6230
19	1800	Zinvert-A5H2250/06	216.5	3800	4400	2675	1586	6430	6730
20	2000	Zinvert-A5H2500/06	250	3800	4400	2675	1586	6684	6984
21	2250	Zinvert-A5H2800/06	270	3900	4500	2710	1600	8105	8114
22	2500	Zinvert-A5H3150/06	300	3900	4500	2710	1600	8650	8704
23	2800	Zinvert-A5H3500/06	400	3900	4500	2710	1600	9023	9323
24	3150	Zinvert-A5H4000/06	400	3900	4500	2710	1600	9660	9960
25	2250	Zinvert-A6H2800/06	270	3900	4500	2710	1600	8105	8114
26	2500	Zinvert-A6H3150/06	300	3900	4500	2710	1600	8650	8704
27	2800	Zinvert-A6H3500/06	400	3900	4500	2710	1600	9023	9323
28	3150	Zinvert-A6H4000/06	400	3900	4500	2710	1600	9660	9960
29	3550	Zinvert-A6H4500/06	480	8000	8600	2910	1586	11614	11914
30		Zinvert-A5H4500/06		8000	8600	2910	1586	11155	11455
31	4000	Zinvert-A6H5000/06	480	8000	8600	2910	1586	12114	12414
32		Zinvert-A5H5000/06		8000	8600	2910	1586	11655	11955
33	4500	Zinvert-A6H5600/06	540	9200	10800	2910	1586	13776	15276
34		Zinvert-A5H5600/06		9200	10800	2910	1586	13317	14817
35	5000	Zinvert-A6H6300/06	600	9400	10800	2910	1586	15438	16938
36		Zinvert-A5H6300/06		9400	10800	2910	1586	14979	16479
37	5600	Zinvert-A6H7000/06	720	9400	11000	2910	1586	15438	16938
38		Zinvert-A5H7000/06		9400	10800	2910	1586	14979	16479
39	6300	Zinvert-A6H8000/06	800	11000	12600	2910	1586	20850	22350
40		Zinvert-A5H8000/06		11000	12600	2910	1586	20250	21750
41	7100	Zinvert-A6H9000/06	900	11000	12600	2910	1586	21650	23150
42	7800	Zinvert-A6H10000/06	1050	13000	14600	2910	1586	23950	25450

注:本配制表的重量仅供参考,实际设备可能会有一定的差异。

► 3kV高压变频系统选型表 3kV HVFD Selection Table

序号 NO.	电机容量 Motor Capacity	变频器型号 Inverter Model	额定输出 电流 (A) Rated output current	总长度 Total Length		高度 Height	总深度 Total Depth	总重 (kg) Total Weight	
	(kW)			手动 Manual	自动 Automatic	(mm)	(mm)	手动 Manual	自动 Automatic
1	250	Zinvert-A3H315/03	60	2600	3200	2675	1586	2010	2310
2	315	Zinvert-A3H400/03	75	2950	3550	2675	1586	2262	2562
3	355	Zinvert-A3H450/03	105	2950	3550	2675	1586	2502	2802
4	400	Zinvert-A3H500/03	105	2950	3550	2675	1586	2563	2863
5	450	Zinvert-A3H560/03	105	2950	3550	2675	1586	2643	2943
6	500	Zinvert-A3H630/03	120	2950	3550	2675	1586	2713	3013
7	560	Zinvert-A3H700/03	150	2950	3550	2675	1586	2844	3144
8	630	Zinvert-A3H800/03	150	2950	3550	2675	1586	2935	3235
9	710	Zinvert-A3H900/03	180	2950	3550	2675	1586	3035	3335
10	800	Zinvert-A3H1000/03	210	2950	3550	2675	1586	3255	3555
11	900	Zinvert-A3H1150/03	245	2950	3550	2675	1586	3591	3891
12	1000	Zinvert-A3H1250/03	245	2950	3550	2675	1586	3841	4141
13	1120	Zinvert-A4H1400/03	270	4800	5400	2675	1200	4386	4686
14	1250	Zinvert-A4H1550/03	300	4800	5400	2675	1200	4586	4886
15	1400	Zinvert-A4H1800/03	360	4800	5400	2675	1200	4999	5299
16	1600	Zinvert-A4H2000/03	400	4800	5400	2675	1200	5598	5898
17	1800	Zinvert-A4H2250/03	480	6680	7280	2675	1586	6898	7198
18	2000	Zinvert-A4H2500/03	480	6680	7280	2675	1586	7198	7498
19	2250	Zinvert-A4H2800/03	540	7200	7800	2710	1586	7623	7632
20	2500	Zinvert-A4H3150/03	600	7200	7800	2710	1586	8123	8177
21	2800	Zinvert-A4H3500/03	720	7200	7800	2710	1586	8323	8623
22	3150	Zinvert-A4H4000/03	800	7200	7800	2710	1586	8623	8923

► 超大容量高压变频器选型表 Ultra-large capacity HVFD Selection Table

序号 NO.	变压器容量 Transformer Capacity	变频器型号 Inverter Model	单元额定输出 电流 (A) Rated unit current output	单元配置 Unit configuration
	(kVA)			
1	20000	Zinvert-S4H20000/10F	1150	ZINVU-1150/45F-175D-C1
2	25000	Zinvert-S4H25000/10F	1450	ZINVU-1450/45F-175D-C1
3	30000	Zinvert-S4H30000/10F	1750	ZINVU-1750/45F-175D-C1
4	40000	Zinvert-S4H40000/10F	2300	ZINVU-2300/45F-175D-C1
5	50000	Zinvert-S4H50000/10F	2900	ZINVU-2900/45F-175D-C1
6	60000	Zinvert-S4H60000/10F	3500	ZINVU-3500/45F-175D-C1
7	12000	Zinvert-S2H12000/06F	1150	ZINVU-1150/45F-175D-C1
8	15000	Zinvert-S2H15000/06F	1450	ZINVU-1450/45F-175D-C1
9	18200	Zinvert-S2H18200/06F	1750	ZINVU-1750/45F-175D-C1
10	24000	Zinvert-S2H24000/06F	2300	ZINVU-2300/45F-175D-C1
11	30000	Zinvert-S2H30000/06F	2900	ZINVU-2900/45F-175D-C1
12	36400	Zinvert-S2H36400/06F	3500	ZINVU-3500/45F-175D-C1
13	6000	Zinvert-S1H6000/03F	1150	ZINVU-1150/45F-175D-C1
14	7500	Zinvert-S1H7500/03F	1450	ZINVU-1450/45F-175D-C1
15	9000	Zinvert-S1H9000/03F	1750	ZINVU-1750/45F-175D-C1
16	12000	Zinvert-S1H12000/03F	2300	ZINVU-2300/45F-175D-C1
17	15000	Zinvert-S1H15000/03F	2900	ZINVU-2900/45F-175D-C1
18	18000	Zinvert-S1H18000/03F	3500	ZINVU-3500/45F-175D-C1

注:设备具体尺寸请与厂家联系。

三、应用案例 Applications

3.1 合作伙伴 Cooperative Partners

公司产品已在全国实现地区性覆盖,并远销至数十个海外国家和地区,为全球节能减排及绿色电能事业做出了贡献。公司以私有云平台、大数据为技术手段,充分发挥“互联网+”的优势,建立了以重点行业、重点区域、大客户为中心的营销与服务平台,为包括电力、建材、冶金、化工、煤炭、港口、市政、新能源等行业数千个客户提供产品、技术及综合技术解决方案,典型客户包括中国国家电网公司、南方电网、五大发电集团、中广核、中国建材、中石化、中石油及宝钢钢铁集团等大型中央企业(集团)。

The company's products have achieved regional coverage across the country and have been exported to dozens of overseas countries and regions, making contributions to the global cause of energy conservation, emission reduction, and green electric power. By using private cloud platforms and big data as technical means, the company has given full play to the advantages of the "Internet +" model and established a marketing and service platform centered on key industries, key regions, and major customers. It provides products, technologies, and comprehensive technical solutions to thousands of customers in industries such as electricity, building materials, metallurgy, chemical engineering, coal, ports, municipal administration, and new energy. Typical customers include large central enterprises (groups) such as State Grid Corporation of China, China Southern Power Grid, the Five Major Power Generation Groups, China General Nuclear Power Group, China National Building Material Group, Sinopec, PetroChina, and Baowu Steel Group.



3.2典型业绩表 Typical Performance

序号 NO.	合同名称 Contract	设备型号 Device Model	电机功率 Motor power	负载 load	行业 Industry	投运时间 runtime
1	山东肥城100MW新型二氧化碳储能项目	ZINVERT-S9H18000/10	15000	空储压缩机	空储	2025
2	山东肥城100MW新型二氧化碳储能项目	ZINVERT-S9H18000/10	15000	空储压缩机	空储	2025
3	延长石油延安天然气储气调峰及配套LNG项目	ZINVERT-A9H16500/10	13200	压缩机	石化	2025
4	延长石油延安天然气储气调峰及配套LNG项目	ZINVERT-R8H13200/10	13200	压缩机	石化	2025
5	延长石油靖边天然气储气调峰及配套LNG项目	ZINVERT-A9H16250/10Y	13000	压缩机	石化	2024
6	延长石油靖边天然气储气调峰及配套LNG项目	ZINVERT-R8H13000/10Y	13000	压缩机	石化	2024
7	新能空气新建朝阳钢铁制氧机工程软起项目	ZINVERT-R8H11000/10Y	11000	压缩机	冶金	2023
8	陕西华电榆横电厂给水泵行星变频项目	ZGMVS-10/14000	10600	给水泵	电厂	2024
9	陕西华电榆横电厂给水泵行星变频项目	ZGMVS-10/14000	10600	给水泵	电厂	2024
10	太行钢铁烧结厂二期脱硫脱销变频软起项目	ZINVERT-R8H5600/10Y	10500	风机	冶金	2022
11	新疆中昆新材料天然气制乙二醇项目	ZINVERT-R8H8700/10Y	8700	压缩机	石化	2023
12	中海油高栏终端主压缩机变频项目	ZINVERT-A8H11250/10Y	8500	压缩机	石化	2024
13	山西高义钢铁烧结主抽变频改造项目三期	ZINVERT-S10H12500/10Y	8000	主抽风机	冶金	2022
14	广西恒逸新材料己内酰胺工程项目	ZINVERT-A8H10000/10	7600	引风机	综合	2024
15	衢州元立金属烧结机脱硝改造项目	ZGMVS-10/8900	7200	增压风机	冶金	2022
16	湖南天一奥星实验平台变频项目	ZINVERT-A8H8900/10Y	7100	水泵	综合	2025
17	山东富伦钢铁烧结机干法脱硫脱硝工程	ZINVERT-A8H8900/10Y	6900	风机	冶金	2022
18	德龙钢铁炼铁总厂烧结机脱硫改造项目	ZINVERT-A8H7800/10	6300	引风机	冶金	2024
19	湘潭发电3#炉变频改造项目	ZINVERT-A6H7800/06Y	6300	联合引风机	电厂	2014
20	华泽铝电#3机组变频改造项目	ZINVERT-A6H6900/06Y	6000	给水泵	电力	2016
21	陕鼓总包安徽首矿大昌金属材料SJ15000项目	ZINVERT-S8H6750/10Y	5800	烧结主抽风机	冶金	2019
22	兰铝自备电厂变频改造项目	ZINVERT-A6H7000/06Y	5600	风机水泵	冶金	2015
23	华泽铝电4#机组变频改造项目	ZINVERT-A6H6900/06Y	5500	风机/水泵	电厂	2015
24	青州中联水泥原料磨循环风机变频项目	ZINVERT-A6H6300/06Y	5200	原料磨循环风机	水泥	2019
25	昆明崇德水泥熟料新型干法水泥生产线项目	ZINVERT-A9H7000/10Y	5000	尾排风机	水泥	2019
26	安阳钢铁3#烧结工程烟气循环项目	ZINVERT-A8H5600/10Y	4300	烧结循环风机	冶金	2020
27	山东新瑞泉能源全液化空分及稀有气体项目	ZINVERT-R8H5000/10Y	3400	离心式空压机	其他	2022
28	东方德森能源烷基化项目	ZINVERT-A8H3150/10Y	2500	离心压缩机	化工	2020
29	山西吉港水泥高压变频项目	Zinvert-A8H1250/10B	800	矿粉立磨除尘风机	水泥	2016
30	天津钢铁公司烧结厂、炼铁厂及炼钢厂高压变频项目	Zinvert-A8H450/10B	355	破碎除尘风机	其他	2017
截至目前, 全国已经投运的智光高压变频系统超过20000套。						

3.2.1特殊负载 Special load

序号 NO.	工程名 Project Name	设备型号 Device Model	电机功率 Motor power	变频应用负载分类 (其它风机/水泵负载) Classification of inverter application loads(Other fan/pump loads)	行业 Industry	年份 Year
1	阳煤永兴煤化高压变频项目	Zinvert-A8H1800/10B	1400	煤矿主扇风机	煤矿	2015
2	山西建邦铸造系统改造项目	Zinvert-A8H4500/10Y	6300	高炉鼓风机	冶金	2016
3	新干盐化工业城热电联产项目	ZINVERT-A8H1500/10B	1250	电动给水泵	电厂	2017
4	鲸石水泥高压变频项目	ZINVERT-A8H2000/10Y	1600	窑尾高温风机	水泥	2018
5	鄂尔多斯电力冶金电石渣 综合利用脱硫剂变频项目	TRQ-1250	1250	锤式烘干破碎机水阻柜	冶金	2018
6	贵州新双龙水泥二期变频项目	Zinvert-A8H2500/10Y	1600	一线高温风机	水泥	2018
7	建邦集团铸造高炉鼓风机 变频项目	ZINVERT-A8H6300/10Y	5000	铸造高炉鼓风机	冶金	2018
8	无锡变维高炉鼓风机变频	ZINVERT-A8H6300/10Y	5000	高炉鼓风机	其他	2019
9	云锡大屯选矿厂球磨机驱动 系统改造项目	Zinvert-A6H500/10B	320	球磨机	冶金	2019
10	山西怀仁中能芦子沟煤矿 改造项目	Zinvert-A5H900/06B	710	对旋式轴流风机	煤矿	2019
11	云锡集团卡房大球磨永磁 同步电机	Zinvert-A6H560/06B	400	大球磨永磁同步电机	冶金	2019
12	福建大东海超高温亚临界煤 气发电工程	ZINVERT-A9H5600/10Y	4500	给水泵	电厂	2020
13	铜陵有色金属变频改造项目	ZINVERT-S6H6300/06Y	4850	半自磨机	冶金	2020
14	云南华联锌铟新田变频调速改造	Zinvert-A9H4000/10Y	2600	半自磨机	冶金	2020
15	东明矿业高压变频项目	ZINVERT-A5H1150/06B	710	上行皮带机	煤炭	2020
16	东莞天龙1#纤维热磨项目	ZINVERT-A8H1800/10B	3550	热磨机	化工	2020
17	辽宁高端金属材料高压 变频项目	ZINVERT-R8H800/10B	630	球磨机重载启动	冶金	2021
18	南阳中联水泥智能制造节能 工程项目	Zinvert-A5H3500/06Y	2500	水泥球磨机	水泥	2021
19	河北吉诚新材料锂盐厂高压 变频项目	ZINVERT-A9H1150/10B	710	立磨电机	石化	2022
20	卫辉春江水水泥智能制造节能 工程项目	Zinvert-A8H4500/10Y	3550	水泥球磨机	水泥	2022
21	庞比磨矿控制系统项目	ZINVERT-S9H4500/10Y	2100	半自磨机	冶金	2023
22	驻马店豫龙同力水泥磨机 变频项目	ZINVERT-A8H5000/10Y	3550	水泥球磨机	水泥	2023

3.3 典型应用案例 Typical Applications

▸ 延长石油靖边天然气储气调峰及配套LNG配置变频项目

产品规格: Zinvert-R8H11000/10Y

项目亮点: 天然气储气调峰及 LNG 生产工况复杂多变, 该装置赋予了系统强大的调节能力。在储气调峰方面, 能根据不同季节、昼夜的用气峰谷, 快速调整压缩机运行参数, 实现精准储气与高效供气。在 LNG 生产环节, 可针对制冷温度、压力等工艺参数的细微变化, 及时调节电机转速, 确保 LNG 生产始终处于最佳状态, 灵活应对市场对天然气及 LNG 产品的多样需求。



Project Name: Inverter Project for the Natural Gas Storage and Peak Regulation of Jingbian by Yanchang Petroleum and the Supporting LNG Configuration

Product Specification: Zinvert-R8H11000/10Y

Project Highlights: The working conditions of natural gas storage and peak regulation as well as LNG production are complex and changeable, and this device endows the system with a powerful adjustment capability. In terms of natural gas storage and peak regulation, it can quickly adjust the operating parameters of the compressor according to the gas consumption peaks and valleys in different seasons and at different times of the day and night, so as to achieve precise gas storage and efficient gas supply. In the LNG production process, it can timely adjust the motor speed in response to the slight changes in process parameters such as the refrigeration temperature and pressure, ensuring that LNG production is always in the best state and flexibly meeting the diverse demands of the market for natural gas and LNG products.

▸ 大唐集团600MW机组联合引风机变频改造项目

应用场景: 火力发电引风机

项目亮点: 改造后变频设备运行稳定、调节特性好, 节能效果明显。



Project name: Datang Group 600MW unit combined induced draft fan frequency conversion transformation project

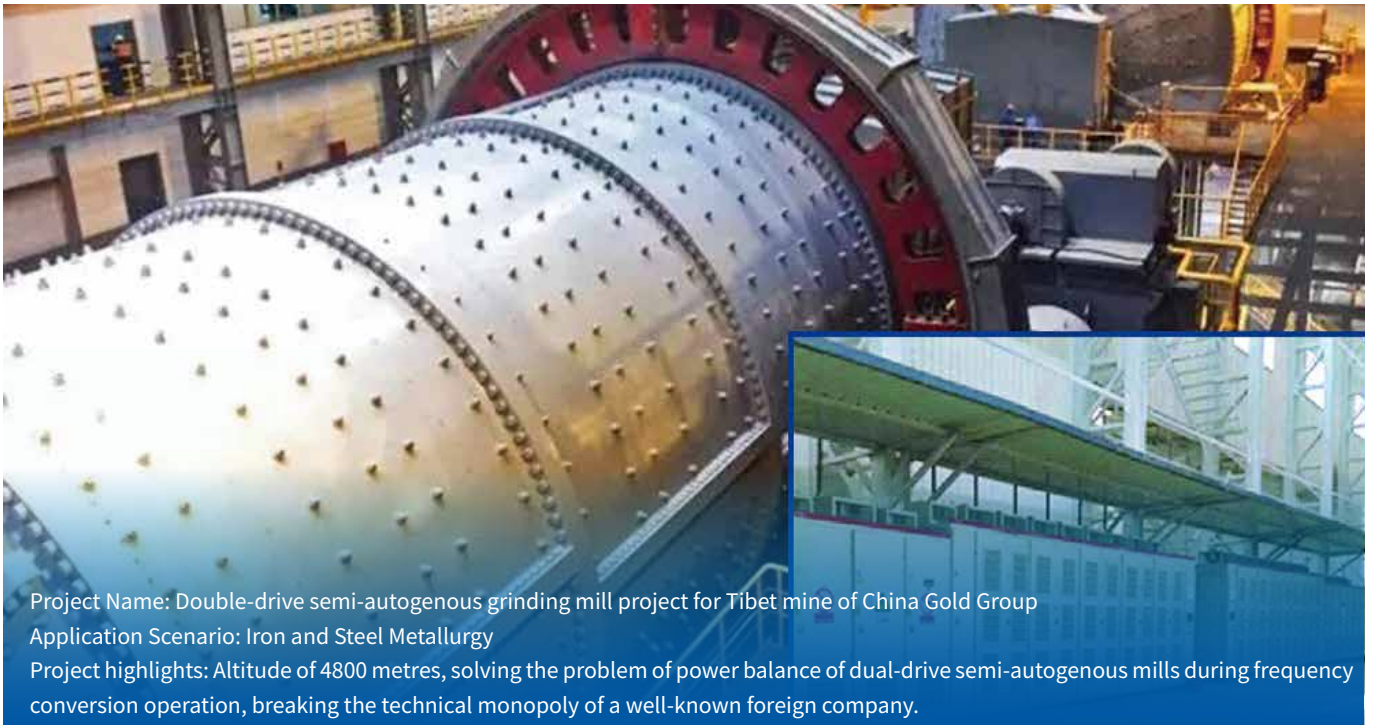
Application scenario: thermal power generation induced draft fan

Project highlights: After the transformation, the frequency conversion equipment operates stably, has good regulation characteristics, and the energy-saving effect is obvious.

► 中国黄金集团西藏矿山双驱半自磨机项目

| 应用场景: 钢铁冶金

| 项目亮点: 海拔高度4800米, 解决双驱半自磨机变频运行时双机功率平衡的难题, 打破国外某知名公司的技术垄断。



► 大唐集团火电厂600MW机组电动给水泵变频改造项目

| 应用场景: 火力发电给水泵

| 项目亮点: 在机组运行小时6500h, 平均负荷率75%的前提下, 综合节电率可达25%, 预计年平均节电量超2000万千瓦时, 综合厂用电率降低近1%。



▶ 全国首创!智光“一拖九”高压变频项目成功投运

| 应用场景:热电风机

| 项目亮点:本次项目的成功投运,克服了高压变频器一拖多面临的电机匹配、保护、线路布置及长度等诸多技术难点,不仅优化了风机的运行效率,还降低了能耗和维护成本,提高了系统的稳定性和安全性。



Project Name:Nation's First! Successful Operation of Zhiguang's "One-to-Nine" High-Voltage Frequency Conversion Project

Application Scenario: Thermal Power Plant Fans

Project Highlights:The successful operation of this project has overcome numerous technical challenges faced by high-voltage frequency converters in a one-to-many configuration, such as motor matching, protection, wiring layout, and length. It not only optimizes the operational efficiency of the fans but also reduces energy consumption and maintenance costs, enhancing the system's stability and safety.

▶ 广西大型造纸企业同步电机专用变流器驱动纸浆磨机项目

| 应用场景:造纸业磨浆机

| 项目亮点:20000kVA电机,采用智光高压变频器一拖二启动方案,可实现年产150万吨原浆和250万吨纸。



Project name: Guangxi large-scale paper-making enterprise synchronous motor special converter drive pulp mill project

Application Scenario: Pulp Mill for Paper Making Industry

Project highlights: 20000kVA motor, using Zhiguang high-voltage inverter one-two start-up solution, can achieve an annual output of 1.5 million tons of raw pulp and 2.5 million tons of paper.

▶ 广州开发区2×460MW级“气代煤”热电冷联产项目

■ 应用场景:火力发电

■ 项目亮点:此项目采用智光18套变频,投产后年发电量42亿kWh,预计年供热量548.6万GJ,为广州科学城及经济技术开发区东区、西区、东莞麻涌等地多家企业提供稳定的热源。



Project Name: Guangzhou Development Zone 2×460MW Gas-to-Coal Cogeneration Project

Application Scenario: Thermal power generation

Project Overview: This project adopts 18 sets of inverter by Zhiguang, with an annual power generation of 4.2 billion kWh after commissioning and an estimated annual heat supply of 5.486 million GJ, providing a stable heat source for many enterprises in Guangzhou Science City and the eastern and western districts of the Economic and Technological Development Zone, as well as Dongguan Mayong and other places.

▶ 德信钢铁高炉工程变频改造项目

■ 应用场景:冶金

■ 项目亮点:项目建成后,炼铁事业部铁水年产将提高到600万吨,德信钢铁成为东南亚第一大钢铁企业,智光电气高压变频器将大力助力建设德信钢铁3#1780m3高炉工程的工作。



Project name: DXN Iron and Steel Blast Furnace Project Frequency Conversion Modification Project

Application Scenario: Metallurgy

Project highlights: After the completion of the project, the annual iron production of the Ironmaking Division will be increased to 6 million tonnes, and DXN Iron & Steel will become the No.1 iron and steel enterprise in Southeast Asia, and Zhiguang Electric high-voltage frequency converter will vigorously assist the construction of the DXN Iron & Steel 3#1780m3 Blast Furnace Project.



四、售后服务

After-sales Service



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Professional Efficient Comprehensive

7大服务中心 Service Center

智光在全国建立了以广州、北京、上海、西安、重庆、武汉、杭州为核心的七大区域服务中心,并在此基础上建立了覆盖全国各大客户服务点及项目部的服务网络,可为客户及合作伙伴提供更加快捷方便、全面周到的优质服务。

Zhiguang has established seven major regional service centres with Guangzhou, Beijing, Shanghai, Xi'an, Chongqing, Wuhan and Hangzhou as the core, and on the basis of which it has set up a service network covering all major customer service points and project departments across the country, which can provide faster, more convenient and comprehensive and considerate high-quality services for customers and partners.

2服务范围 Service Scope

标准化质保:预调试、安装调试、预防性维护、备件供应、现场服务、优化服务、智能运维。

定制化服务:定制化方案设计、多元合作模式、培训服务。

Standardised Warranty: pre-commissioning, installation and commissioning, preventive maintenance, spare parts supply, on-site service, optimisation service, intelligent O&M.

Customised services: customised programme design, multiple cooperation models, training services.

2/48服务承诺 Service Commitment

在收到服务需求后2小时内做出响应,48小时内人员到达现场。

Respond within 2 hours after receiving the service demand, and personnel arrive at the site within 48 hours.

1服务平台 Service Platform

“综合能源服务工业互联网平台”以大数据赋能技术研发、产品制造、系统集成、设备运维、能效提升、能源交易等综合能源服务产品核心环节,帮助客户实现从要素驱动到数据驱动的转向升级。

"Comprehensive Energy Service Industrial Internet Platform" empowers the core aspects of comprehensive energy service products, such as technology research and development, product manufacturing, system integration, equipment operation and maintenance, energy efficiency improvement, energy trading, etc., with big data, and helps customers realise the transformation and upgrade from factor-driven to data-driven.

24小时客户服务中心:400-8800-233
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