

VEICHI

ACH100 Series MV Inveter



VEICHI

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Features

High efficiency, no pollution, high power factor

ACH100 MV inverter adopts the high-high scheme of power unit series connection. It adopts multi-winding high-voltage phase-shifting transformer. The current flowing in the secondary winding forms a current waveform that is very close to the sine wave when superimposed on the primary side of the transformer. After testing, at 50Hz operation, the grid side current harmonics <2%, the motor side output voltage harmonics <1.5% (still <2% even at 40Hz), the efficiency of the complete unit >96% (at full load), Power factor > 0.95.

It fully meets the requirements of IEEE 5199-1992 for voltage and current harmonic content.

The self-developed dedicated PWM control method can further reduce the output voltage harmonics by 1~2% compared with other control methods of similar products.

Advanced fault unit bypass operation (professional core technology)

In order to improve the reliability of the system, a certain output voltage margin is considered in the whole variable frequency speed control system, and a bypass circuit is added in each power unit. When a power unit fails, it can automatically monitor the fault and start the bypass circuit, so that the unit is no longer put into operation, and the program will automatically calculate and adjust the algorithm so that the output three-phase line voltage is still completely symmetrical. The motor operation is completely unaffected.

High-performance control technology

The ACH100 series high-voltage variable frequency speed control system is the first to realize the simple vector control technology, which can realize the fast dynamic response of constant torque, and has the adaptive function of acceleration and deceleration, which can automatically adjust the acceleration and deceleration time according to the actual conditions of the operating conditions. When the maximum allowable current is not exceeded, the set frequency or speed is quickly reached. At the same time, the system has a speed tracking function. The user can ignore the current running state of the motor, and the motor does not need to stop turning the machine to start, accelerate, decelerate or Stop operation.

High reliability

The control power supply can realize automatic switching between external 220V power supply and high voltage power supply auxiliary power supply. At the same time, the UPS is configured. Even if both power supplies fail, the control system can still work for a long enough time to control the entire system to stop safely and issue an alarm. And record all status parameters at the time of the failure.

The high voltage main circuit and the low voltage control circuit are optically transmitted and safely isolated, so that the system has strong anti-interference ability.

When the number of faulty units exceeds the set value, the system can switch to the power frequency operation.

The phase shifting transformer has a complete temperature monitoring function.

The unique power cabinet air duct design, the main heating elements are close to or in the air duct, the heat dissipation effect is good, and the overload capability of the system is guaranteed.

The anti-grid voltage fluctuation ability is strong, and the voltage can work normally when the voltage changes within the range of -35% to +15%; when the grid voltage fluctuates within the range of -15%~+15%, the system can reach the rated output.

Special Function

Speed tracking function

Mainly in the process of starting and switching from power frequency to frequency conversion due to the external direction of the fan, such as the boiler blower of the power plant, the induced draft fan, the high temperature fan of the cement plant. If the speed tracking start is not used, the inverter starts from 0Hz. This is because the frequency (speed) of the rotor is greater than the frequency (speed) of the stator, so that the motor is in the generator state, and the energy is fed back to the inverter, resulting in a fast bus voltage of the inverter. Ascending, reaching the protection limit and protecting the action, causing the start failure. If the speed tracking is started, the inverter detects the test speed of the rotor and then outputs the same frequency as the rotor, so that no power is fed back to the DC bus of the inverter. Then, there will be no overvoltage protection to start the motor smoothly.



Neutral point offset function

In order to improve the reliability of the system, the variable frequency speed control system considers a certain output voltage margin, and a bypass circuit is designed in each power unit. When a power unit fails, the fault can be automatically monitored and the bypass circuit can be started. Therefore, the unit is no longer put into operation, and the program will automatically continue the operation and adjust the algorithm so that the output three-phase line voltage is still completely symmetrical, and the operation of the motor is not affected at all. This control method is at the international advanced level and leading level in China, which will greatly improve the reliability and stability of the system.

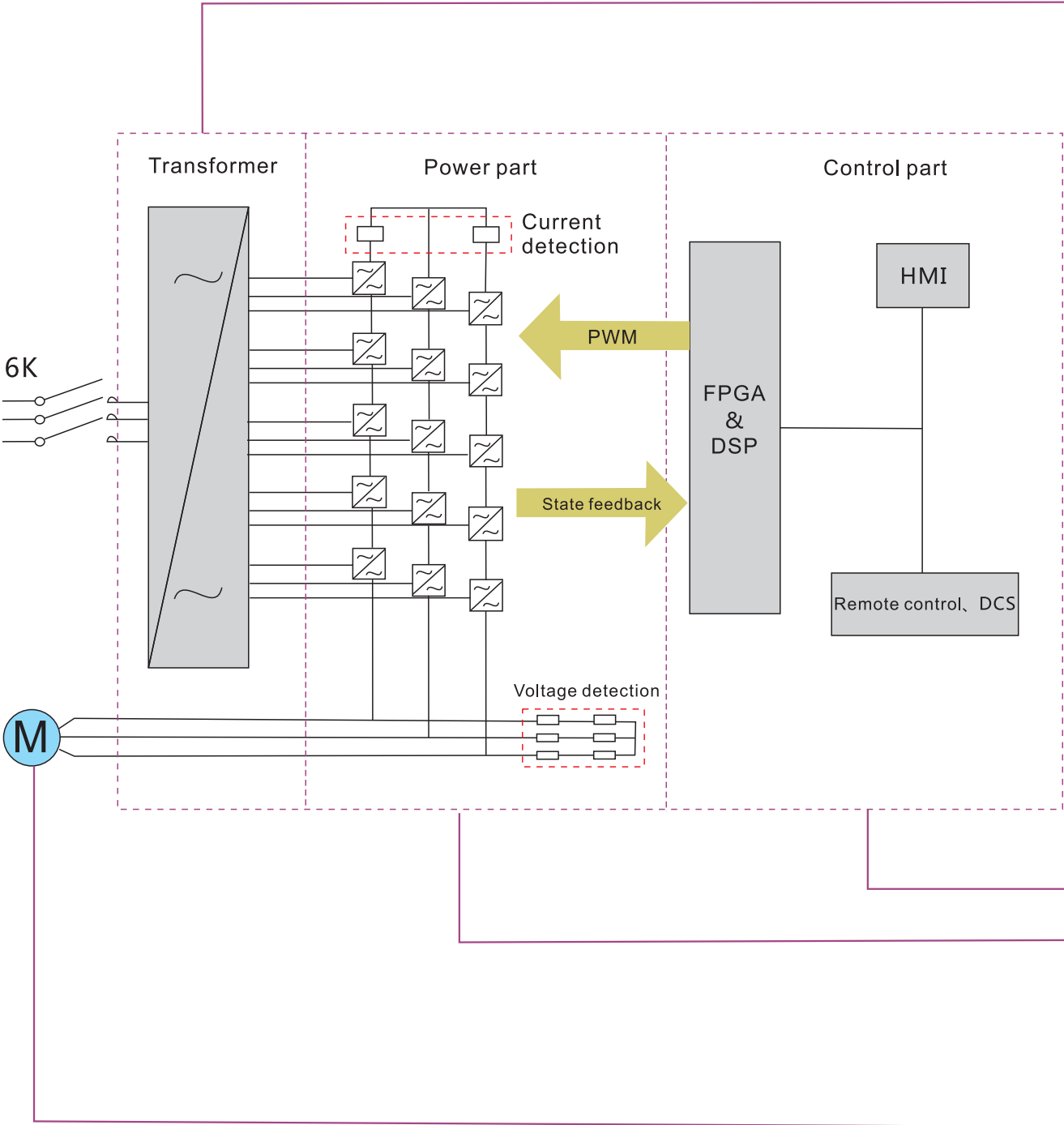
DC braking and restart function

When the fan is started, it is necessary to close the damper regardless of the power frequency or the frequency conversion operation. If the damper is not closed or the valve is not closed, the fan blades will rotate or reverse due to air leakage, which will increase the starting torque of the fan and easily cause overcurrent or overvoltage protection. The DC braking and restart function is to use the DC braking function of the inverter to make the rotating motor stand still and then start the inverter from 0Hz, which will not cause the inverter to trip due to overcurrent or overvoltage protection. For example, if the boiler is operated by a fan system, if one of the fans is running and the other fan is started, because the damper cannot be completely closed, another fan will be reversed due to air leakage. If the inverter starts immediately from 0 Hz, it is bound to be started. Can cause overcurrent or overload. If the first brake restart function is used, the motor can be braked first, and the inverter can be started after the fan is stationary. This problem can be avoided.

Power unit bypass function

In order to improve the reliability of the system, first of all, the entire variable frequency speed control system reserves a certain output voltage margin, and a bypass circuit is added in each power unit. When the power unit detects its own fault, it immediately starts the bypass circuit and exits the operation. At the same time, the main control system automatically adjusts the algorithm so that the output three-phase line voltage is completely symmetrical, ensuring that the operation of the motor is not affected. Secondly, after the power unit is bypassed for a period of time, the system rechecks the status of the unit. If the status is restored, the system will adjust the algorithm again and put the unit back into operation.

High-voltage inverter overall system



The phase-shifting rectifier transformer provides independent isolated power for each unit. The phase-shifting rectification has minimal impact on the grid. The input current and voltage waveforms at 80% load



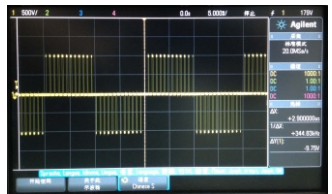
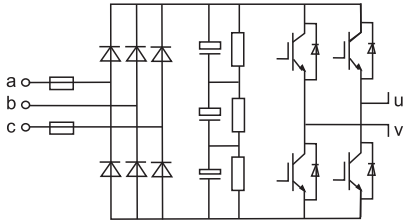
Main control system

- The control system adopts the touch screen + PLC + main control board serial structure to reduce data circulation and balance the data processing pressure of each module. All data transmission adopts serial communication, which enhances the anti-interference ability of the system and ensures long-term stable operation of the system.
- The main control core part adopts DSP+FPGA combination control. The DSP with the main frequency of 100M realizes the high-speed processing of data to ensure the real-time performance of the system; the internal logic clock of FPGA is up to 150M, the communication between modules is basically no delay, and the parallel processing of data is more It speeds up logic operations and system protection.

The schematic diagram of the main circuit power unit is shown as below. It is mainly composed of rectifier bridge, electrolytic capacitor and IGBT. It adopts unique double-edge frequency double-frequency drive technology to greatly reduce the heat generation of IGBT, and the system operation is more stable. Modular structure design is adopted. Easy installation and post maintenance.



Unit Drive Waveform



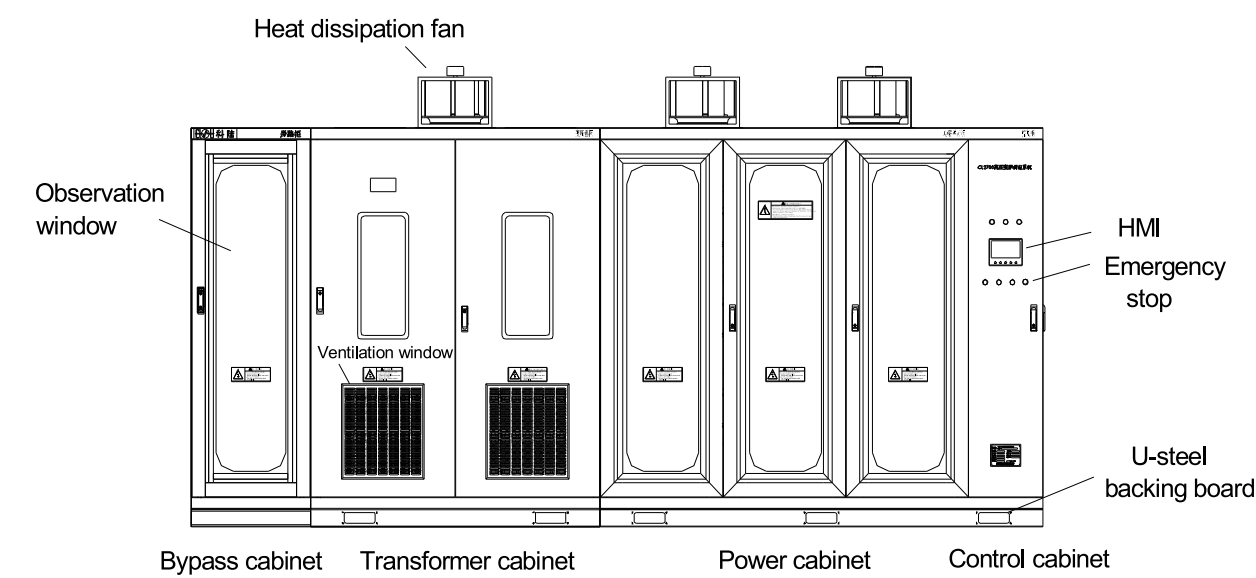
Unit output voltage waveform

The power unit is connected in series to output a perfect sine wave, and the waveform is output at 80% load



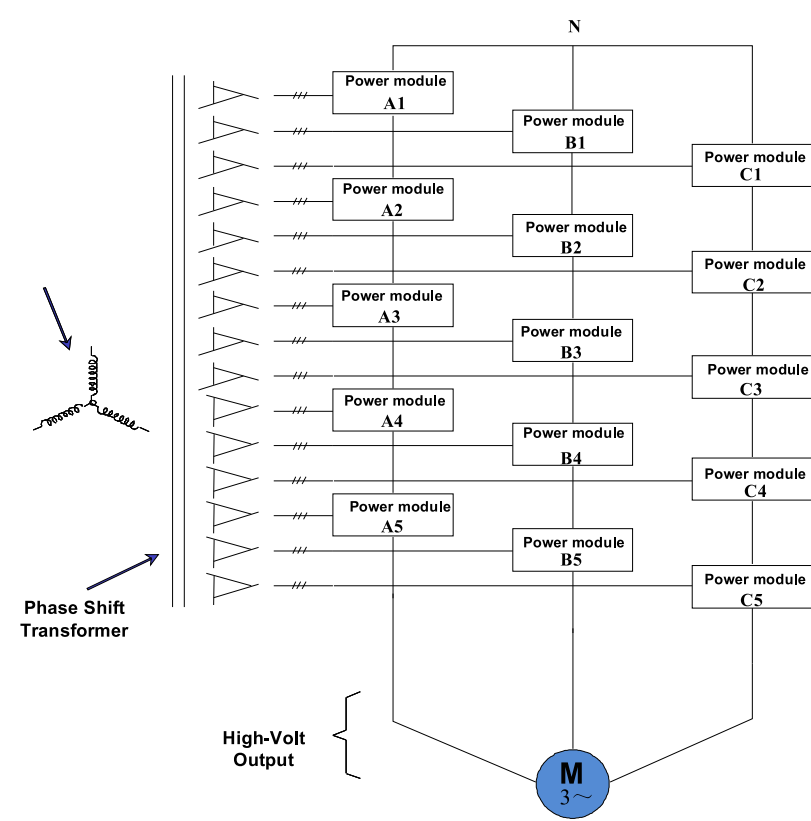
ACH100 series VVVF system

The components of the ACH100 series high-voltage variable frequency speed control system include transformer cabinet, power cabinet, control cabinet and bypass cabinet (optional), as shown in Figure 1.



Typical components of ACH100 high voltage variable frequency speed control system

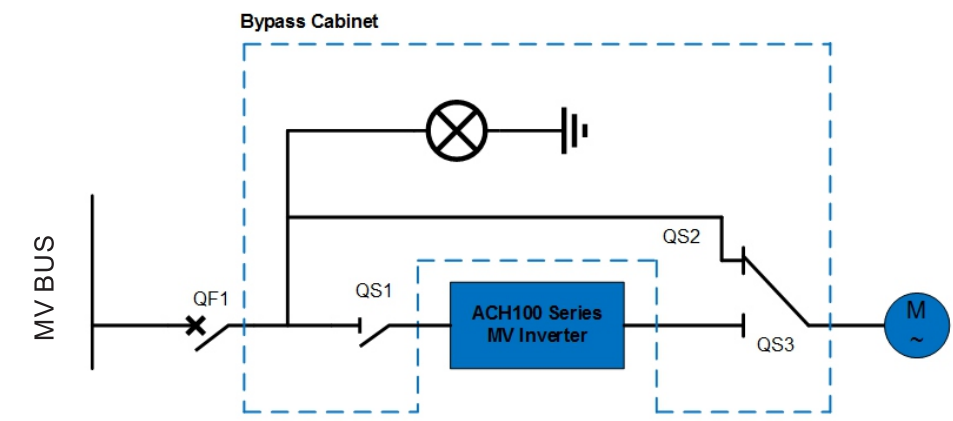
Schematic diagram of unit series H-bridge power circuit



ACH100 series technical solution

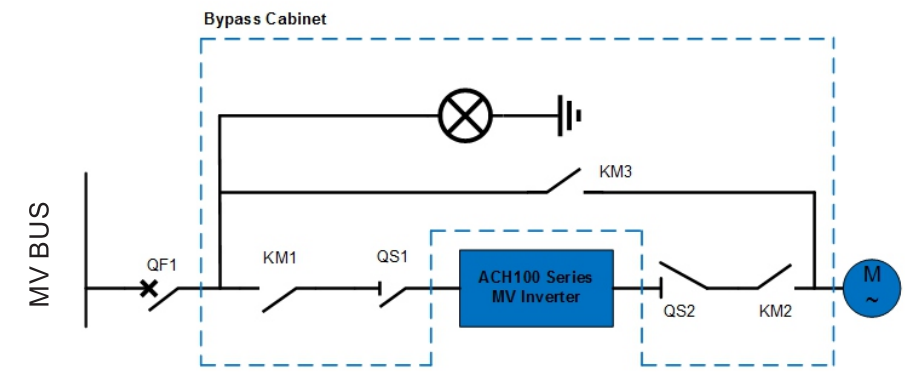
One dragging one manual solution

It is the standard configuration of the inverter, which can switch the load and power frequency of the load, which can ensure the safety of the inverter during maintenance.



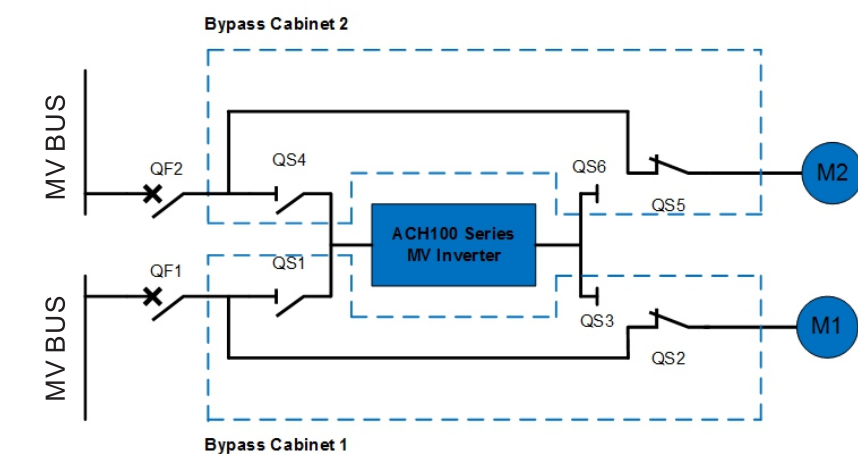
One dragging one automatic solution

It can switch the load and power frequency of the load, which can ensure the safety of the inverter maintenance. This system should be used when the system requires a short switching time.



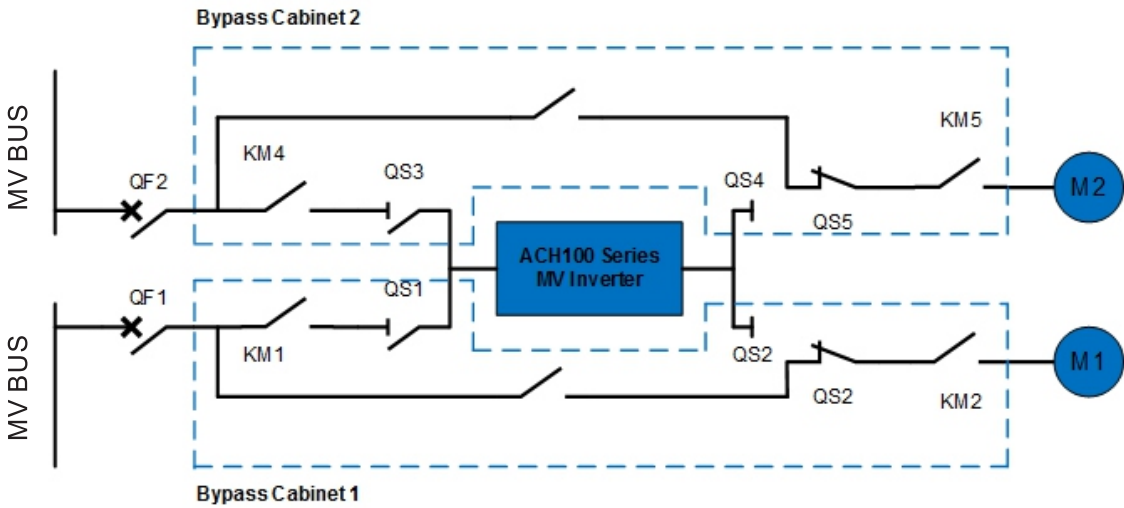
One dragging two manual solution

In addition to the one-to-one system, it is also possible to switch between two loads to meet the periodic operation of the two loads.



One dragging two automatic solution

In addition to the one-to-one system function, it is also possible to quickly switch between two loads, which should be used when the system requires a short switching time.



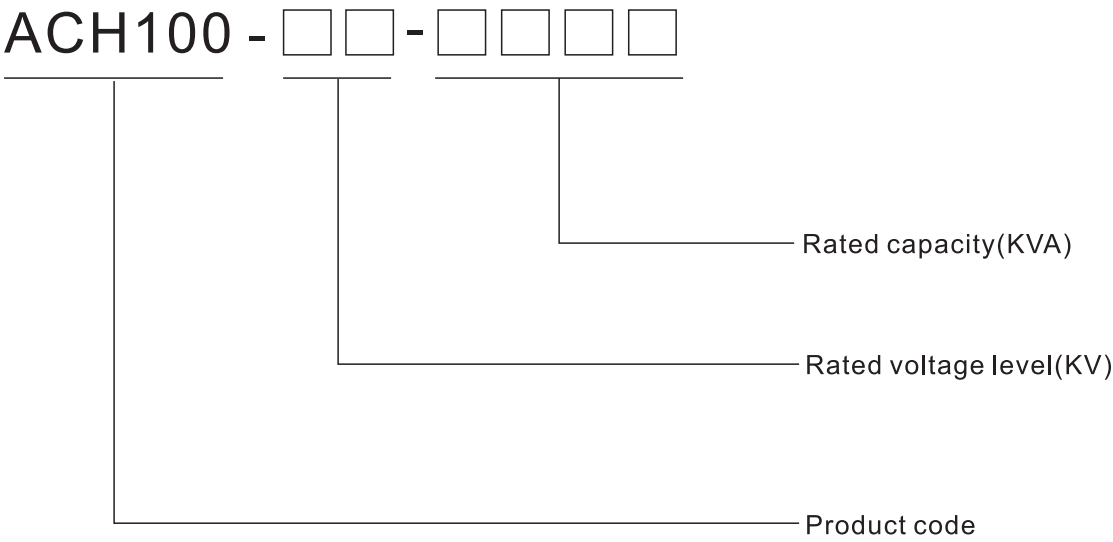
Technical Specifications

Input	Voltage/frequency of main loop	3~10kV, 45~55Hz
	Control loop	Single-phase 220V or three phase 380V, 50Hz/60Hz
	Allowable variation	Voltage: -35% ~ +15%. Voltage unbalance factor: <3%, frequency: ±10%
	Input power factor	> 0.95 (>20% rated load)
Output	Applicable motor (kW)	160~3550(3kV), 200~8000(6kV), 250~10000(10kV).
	Rated capacity (kVA)	200~4500 (3kV) 300~10000 (6kV) 350~125000 (10kV)
	Rated voltage (3-phase)	3~10kV
	Overload capacity of current	1 minute for 120% of rated load; 3 seconds for 150%; immediate protection for 180%
	Output frequency	0.5~120Hz
Operational control characteristics	Inverter efficiency	> 0.97 (under rated load)
	Control mode	VVVF control of high performance automatic slip compensation, simple vector control
	Maximum frequency	50~120Hz
	Basic frequency	20~60Hz
	Starting frequency	0.01~10Hz
	Frequency resolution	Analogue setting: 0.1%; digital setting: 0.01Hz
	Frequency accuracy	Analogue setting: ±0.5% of maximum frequency; digital setting: ±0.1% of maximum frequency
	Acceleration/deceleration time	1~3600s available
	Characteristics of voltage/frequency	Constant V/F when under basic frequency, constant power when over basic frequency
	Frequency setting	Digital panel operation or analogue setting (4~20mA), host computer communication setting
Structure	Protection class	IP41, other classes can be tailor-made
	Overall structure	Multi-cabinet type
	Cooling mode	Forced-air cooling by the fan at the top

Output signal	Relay output	250VAC 12A/50VDC 1A
	Open-circuit collector output	24VDC, max. 100mA, output impedance 30~35Ω
	Calibration of analogue meter	50.0~200.0% (minimum unit: 0.1%)
	Output of analogue meter	4~20mA or 0~10V
Protection	Inverter input overvoltage & undervoltage protection, inverter over current protection, inverter output short-circuit protection, overheating protection of input transformer, DC overvoltage & undervoltage protection and over temperature protection of power unit, communication failure protection of power unit, inverter overvoltage & over current stalling protection, failure protection of control power, etc.	
Application environment	Operating temperature: 0℃ ~+45℃ Storage temperature: -40℃ ~+70℃ Relative humidity: 5%~90% (non-condensing) Elevation: <1000m, derating for over 1000m	
Safety specifications	High-voltage inverter properly grounded, the resistance of the metal part possibly contacted and enclosure grounding location is no more than 0.1Ω, capable of withstanding the short-circuit impact calculated as per corresponding switch (over 40kA), the grounding point has conspicuous grounding mark. The high-voltage inverter is equipped with electric shock prevention facilities like shielding case inside.	

ACH100 series specifications

Naming rules and definitions



ACH100 10KV Manual bypass cabinet one dragging one series

Model	Inverter capacity (KVA)	Adapted motor power (KW)	Motor rated current (A)	Dimension (Width/deep/height mm)	Manual Bypass cabinet	Auto Bypass cabinet
ACH100-10-0250	315	250	20	2650*1500*2580	BP10-M-250	BP10-A-250
ACH100-10-0280	355	280	20	2650*1500*2580	BP10-M-280	BP10-A-280
ACH100-10-0315	400	315	23	2650*1500*2580	BP10-M-315	BP10-A-315
ACH100-10-0355	450	355	25	2650*1500*2580	BP10-M-355	BP10-A-355
ACH100-10-0375	475	375	27	2650*1500*2580	BP10-M-375	BP10-A-375
ACH100-10-0400	500	400	29	2650*1500*2580	BP10-M-400	BP10-A-400
ACH100-10-0425	530	425	31	2650*1500*2580	BP10-M-425	BP10-A-425
ACH100-10-0450	560	450	32	2650*1500*2580	BP10-M-450	BP10-A-450
ACH100-10-0475	600	475	34	2650*1500*2580	BP10-M-475	BP10-A-475
ACH100-10-0500	630	500	36	2650*1500*2580	BP10-M-500	BP10-A-500
ACH100-10-0530	670	530	38	2650*1500*2580	BP10-M-530	BP10-A-530
ACH100-10-0560	700	560	40	2650*1500*2580	BP10-M-560	BP10-A-560
ACH100-10-0600	750	600	43	2650*1500*2580	BP10-M-600	BP10-A-600
ACH100-10-0630	800	630	45	2650*1500*2580	BP10-M-630	BP10-A-630
ACH100-10-0670	850	670	48	2650*1500*2580	BP10-M-670	BP10-A-670
ACH100-10-0710	900	710	51	2650*1500*2580	BP10-M-710	BP10-A-710
ACH100-10-0750	950	750	54	2650*1500*2580	BP10-M-750	BP10-A-750
ACH100-10-0800	1000	800	58	2650*1500*2580	BP10-M-800	BP10-A-800
ACH100-10-0850	1050	850	61	2650*1500*2580	BP10-M-850	BP10-A-850
ACH100-10-0900	1120	900	64	2650*1500*2580	BP10-M-900	BP10-A-900
ACH100-10-0950	1200	950	69	2650*1500*2580	BP10-M-950	BP10-A-950
ACH100-10-1000	1250	1000	72	2650*1500*2580	BP10-M-1000	BP10-A-1000
ACH100-10-1120	1400	1120	81	2650*1500*2580	BP10-M-1120	BP10-A-1120
ACH100-10-1250	1600	1250	90	2650*1500*2580	BP10-M-1250	BP10-A-1250
ACH100-10-1400	1800	1400	101	2650*1500*2580	BP10-M-1400	BP10-A-1400
ACH100-10-1600	2000	1600	115	6100*1300*2550	BP10-M-1600	BP10-A-1600
ACH100-10-1800	2250	1800	130	6100*1300*2550	BP10-M-1800	BP10-A-1800
ACH100-10-2000	2500	2000	145	6100*1300*2550	BP10-M-2000	BP10-A-2000
ACH100-10-2240	2800	2240	162	6800*1300*2750	BP10-M-2240	BP10-A-2240
ACH100-10-2500	3150	2500	180	6800*1300*2750	BP10-M-2500	BP10-A-2500
ACH100-10-2800	3500	2800	202	6800*1300*2750	BP10-M-2800	BP10-A-2800
ACH100-10-3150	4000	3150	227	6800*1300*2750	BP10-M-3150	BP10-A-3150
ACH100-10-3550	4500	3550	256	6800*1300*2750	BP10-M-3550	BP10-A-3550
ACH100-10-4000	5000	4000	289	6800*1300*2750	BP10-M-4000	BP10-A-4000
ACH100-10-4500	5600	4500	325	6900*1500*2950	BP10-M-4500	BP10-A-4500
ACH100-10-5000	6300	5000	361	6900*1500*2950	BP10-M-5000	BP10-A-5000
ACH100-10-5600	7000	5600	405	6900*1500*2950	BP10-M-5600	BP10-A-5600
ACH100-10-6300	8000	6300	455	6900*1500*2950	BP10-M-6300	BP10-A-6300

ACH100 6KV Manual bypass cabinet one dragging one series

Model	Inverter capacity (KVA)	Adapted motor power (KW)	Motor rated current (A)	Dimension (Width/deep/height mm)	Manual Bypass cabinet	Auto Bypass cabinet
ACH100-06-0250	315	250	30	2650*1500*2580	BP06-M-250	BP06-A-250
ACH100-06-0280	350	280	34	2650*1500*2580	BP06-M-280	BP06-A-280
ACH100-06-0300	375	300	36	2650*1500*2580	BP06-M-300	BP06-A-300
ACH100-06-0315	400	315	38	2650*1500*2580	BP06-M-315	BP06-A-315
ACH100-06-0355	450	355	43	2650*1500*2580	BP06-M-355	BP06-A-355
ACH100-06-0375	475	375	45	2650*1500*2580	BP06-M-375	BP06-A-375
ACH100-06-0400	500	400	48	2650*1500*2580	BP06-M-400	BP06-A-400
ACH100-06-0425	530	425	51	2650*1500*2580	BP06-M-425	BP06-A-425
ACH100-06-0450	560	450	54	2650*1500*2580	BP06-M-450	BP06-A-450
ACH100-06-0475	600	475	57	2650*1500*2580	BP06-M-475	BP06-A-475
ACH100-06-0500	630	500	60	2650*1500*2580	BP06-M-500	BP06-A-500
ACH100-06-0530	670	530	64	2650*1500*2580	BP06-M-530	BP06-A-530
ACH100-06-0560	700	560	67	2650*1500*2580	BP06-M-560	BP06-A-560
ACH100-06-0600	750	600	72	2650*1500*2580	BP06-M-600	BP06-A-600
ACH100-06-0630	800	630	76	2650*1500*2580	BP06-M-630	BP06-A-630
ACH100-06-0670	850	670	81	2650*1500*2580	BP06-M-670	BP06-A-670
ACH100-06-0710	900	710	85	2650*1500*2580	BP06-M-710	BP06-A-710
ACH100-06-0750	950	750	90	2650*1500*2580	BP06-M-750	BP06-A-750
ACH100-06-0800	1000	800	96	2650*1500*2580	BP06-M-800	BP06-A-800
ACH100-06-0850	1060	850	102	2650*1500*2580	BP06-M-850	BP06-A-850
ACH100-06-0900	1120	900	108	2650*1500*2580	BP06-M-900	BP06-A-900
ACH100-06-0950	1200	950	114	2650*1500*2580	BP06-M-950	BP06-A-950
ACH100-06-1000	1250	1000	120	2650*1500*2580	BP06-M-1000	BP06-A-1000
ACH100-06-1120	1400	1120	135	2650*1500*2580	BP06-M-1120	BP06-A-1120
ACH100-06-1250	1600	1250	150	2650*1500*2580	BP06-M-1250	BP06-A-1250
ACH100-06-1400	1800	1400	168	2650*1500*2580	BP06-M-1400	BP06-A-1400
ACH100-06-1600	2000	1600	192	5450*1300*2750	BP06-M-1600	BP06-A-1600
ACH100-06-1800	2250	1800	217	5450*1300*2750	BP06-M-1800	BP06-A-1800
ACH100-06-2000	2500	2000	240	5450*1300*2750	BP06-M-2000	BP06-A-2000
ACH100-06-2240	2800	2240	269	5450*1300*2750	BP06-M-2240	BP06-A-2240
ACH100-06-2500	3150	2500	303	5450*1300*2750	BP06-M-2500	BP06-A-2500
ACH100-06-2800	3500	2800	340	5550*1500*2950	BP06-M-2800	BP06-A-2800
ACH100-06-3150	4000	3150	385	5550*1500*2950	BP06-M-3150	BP06-A-3150
ACH100-06-3550	4500	3550	430	5550*1500*2950	BP06-M-3550	BP06-A-3550
ACH100-06-4000	5000	4000	481	5550*1500*2950	BP06-M-4000	BP06-A-4000

Bypass cabinet

Bypass cabinet	dimension	Weight (T)
Manual cabinet	700*1300*2200	0.8
Auto-cabinet	1100*1300*2200	1.1

Applications



Electric power industry

Boiler feed water pump, blower, induced draft fan, primary fan, secondary fan, condensate pump, etc.



Petrochemical industry

Large oil pump, water injection pump, boiler feed water pump, brine pump, gas compressor, etc.



Mining industry

Drain pump, ventilation fan, etc.



Metallurgical Industry

Blast furnace blower, induced draft fan, dust removal fan, feed water pump, etc.



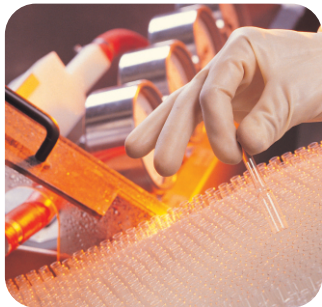
Cement & Ceramic industry

Grinder, suction fan, induced draft fan, blower, cooling fan, kiln air supply fan, etc.



Municipal industry

Tap water pump



Other industry

Paper, pharmaceutical, sewage treatment, etc

Company profile



Founded in 2005, VEICHI Electric is a national high-tech and a “dual-soft ” enterprise engaged in the research, development, production and sales of industrial automation products. It has established two research and production bases with independent intellectual rights in Shenzhen and Suzhou. The ever-increasing ability to innovate, highlighting flexible customization capabilities, and increasingly improved delivery capabilities have earned the trust and cooperation of customers around the world.

The company’s products cover the general VFD, servo and motion control system, integrated special drive and Internet of Things, etc., and provide advanced industry integraed solution and design for printing and packaging, pumps, machine tools and compressors, hydraulic servo, lifting, textile and other industries. Product development and design, comprehensive product development testing and automated information production,to provide customers with the most optimized industrial automation system solutions.

The core talents and backbone talents in the product R&D field of the industry meet the needs of talents in future R&D planning. The company has independent intellectual property rights and core technologies, and at least 10% of annual sales revenue will be invested in product development.

In the future, VEICHI Electric will continue to drive the endless brand strength and create a better tomorrow with you.