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ELECTRICAL SAFETY
GUARD



环宇电气

启智

Set Sail Safely
Lead the Future
with Wisdom

| HYB3 Vector Frequency Converter |





Huanyu Group Zhejiang Hi-tech Co., Ltd. is a Chinese localized high-tech enterprise focusing on the production and sales of low-voltage electrical components, which is jointly established by the national large-scale comprehensive enterprise Huanyu Group and the global power management company Eaton Group in 2021.

The joint venture company takes customers first as its value orientation and drives the upgrade of operation and management, striving to create an "one-stop" service for electrical systems. The company attaches the most importance to the low-voltage electrical components production and system solutions and integrate research, production and sales. The business covers distribution electrical, industrial control automation, household electrical, new energy and so on. The company has built more than 20 comprehensive service centers, more than 30 marketing offices, more than 600 terminal image franchise stores, and more than 800 sales outlets.

Many of the company's products have been rated as Chinese famous brand products, national customer satisfaction products, Zhejiang famous brand products, Zhejiang manufacturing quality certification and Zhejiang "Product" word mark right to use, and Wenzhou mayor quality award. The company has successively won the titles of national-level "contract-honoring and credit-worthy" enterprise, national customer satisfaction enterprise, national high-tech enterprise, Zhejiang famous business name, Zhejiang green enterprise, Zhejiang large taxpayer and so on.

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After the joint venture, Huanyu Group Zhejiang Hi-tech Co., Ltd. will continue to take "committed to smart electrical and make life better" as its mission. The company attaches the most importance to the low-voltage electrical components production and system solutions and integrates research, production and sales. It introduces international management experience and processes, while also focusing on product R&D and innovation and cultivating local talent teams, thereby building a modern channel network to stand committed to the Chinese market.



Set Sail Safely Lead the Future with Wisdom



Brand new family design



Overall improvement of performance
Achieve the zero flashover



Optimize the shell frame grade
Improve the cost performance



Comprehensively improve the breaking capacity
With the normal type and the high breaking type



Meet the harsh use environment
With the ambient temperature of -40°C — $+70^{\circ}\text{C}$



Monitor the internal temperature in real time
Be safer and more reliable



Intelligent controller and more perfect measurement, query and function setting



Through the USB interface and the WIFI function
Realize convenient operation



Excellent long service life
High reliability



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- 警告**
- 请勿在通电状态下进行维护
 - 请勿在通电状态下进行接线
 - 请勿在通电状态下进行拆卸
 - 请勿在通电状态下进行安装
 - 请勿在通电状态下进行搬运

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CONTENT



HYB3 Universal Vector Frequency Converter

**Product Introduction
Outline and Installation
Dimensions**



Accessories

Product Accessories

HYB3 Universal Vector Frequency Converter

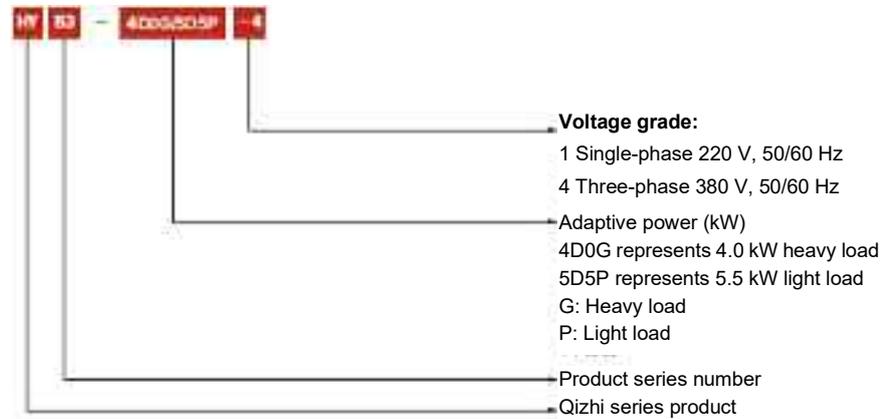
Functions and Characteristics



Product Overview

The HYB3 Series Frequency Converter is a high-performance open-loop current vector frequency converter with excellent vector control performance, which realizes the integration of torque control and speed control. The HYB3 Frequency Converter's control software integrates the advanced current vector control technology and magnetic flux vector control technology, which truly realizes AC motor decoupling, low-frequency rated torque output and ultra-quiet stable operation. The HYB3 Series Frequency Converter is characterized by the high integration, reasonable structure, perfect protection and high reliability. Hardware configuration and software functions have greatly improved the customer's use experience and environmental adaptability, and can well meet various usage requirements.

Model Description



Normal Working Conditions

Technical features

- ⊙ Multi-stage frequency wobbling operation;
- ⊙ Three control modes: PG-free vector control (SVC), V/F control and torque control;
- ⊙ Starting torque: PG-free vector control: 0.5 Hz/150% (SVC);
- ⊙ 0.75 kW–15 kW built-in braking units in various specifications, and if quick stop is needed, the braking resistor can be directly connected;
- ⊙ Support multiple frequency setting modes: Digital setting, analog setting, PID setting, communication setting, etc.;
- ⊙ Support start and stop DC braking;
- ⊙ Input and output terminals are freely programmable, and users can combine various working modes according to their requirements;
- ⊙ It has the hopping frequency control function to avoid mechanical resonance, which makes the system more stable and reliable;
- ⊙ It has the not-stop function during instantaneous power failure;
- ⊙ It has the sleep and wake-up delay setting function;
- ⊙ It has the over-torque detection function;
- ⊙ Low noise, automatic voltage stabilization, low frequency and high torque;
- ⊙ Various upper limiting frequency setting source options;
- ⊙ Real-time parameters can be viewed through the shift key with the bidirectional shift function;

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- ⊙ It has the speed tracking restart function: Shock-free smooth start of the motor in rotation is realized;
- ⊙ QUICK/JOG function: Users can freely define multi-function shortcut keys, and the relevant function codes that are different from the factory default values after modification can be quickly browsed by setting these parameters;
- ⊙ It has the automatic voltage adjustment function: When the grid voltage changes, the output voltage is automatically kept constant;
- ⊙ It has the oscillation suppression function: The problem of low-frequency oscillation of high-power motors is effectively solved;
- ⊙ It provides multiple fault protection functions: Overcurrent, overvoltage, undervoltage, excess temperature, phase loss, overload and other protection functions.

Industries of application

The Huanyu Qizhi HYB3 Frequency Converter is widely applied in fans, water pumps, air compressors, injection molding machines, winding machines, central air conditioners, textile machines, chemicals, metallurgy, mining, pharmaceuticals, ceramics, papermaking, oil fields, plastics, printing, thermoelectricity, tobacco, food and other machinery and equipment.

Main Technical Parameters

Voltage grade	Rated power (kW)	Rated output current (A)	Adaptive motor (kW)
220 V single-phase	0.4	2.4	0.4
	0.75	4.5	0.75
	1.5	7	1.5
	2.2	10	2.2
380 V three-phase	0.4	1.2	0.4
	0.75	2.5	0.75
	1.5	3.7	1.5
	2.2	5.0	2.2
	4	9/13	4/5.5
	5.5	13/17	5.5/7.5
	7.5	17/25	7.5/11
	11	25/32	11/15
	15	32/37	15/18.5
	18.5	37/45	18.5/22
	22	45/60	22/30
	30	60/75	30/37
	37	75/90	37/45
	45	90/110	45/55
	55	110/150	55/75
	75	150/176	75/90
	90	176/210	90/110
	110	210/250	110/132
	132	250/300	132/160
	160	300/340	160/185
185	340/380	185/200	
200	380/415	200/220	
220	415/470	220/250	
250	470/520	250/280	
280	520/600	280/315	
315	600/640	315/350	
350	640	350	

Product Technical Indicators and Specifications

Input	Rated voltage and frequency	Three-phase (4# series) 380 V; 50/60 Hz
		Single-phase (1# series) 220 V; 50/60 Hz
	Voltage allowable change range	Three-phase (4# series) 320 V–460 V
		Single-phase (1# series) 160 V–260 V
Output	Voltage	4# series; 0–460 V
		1# series; 0–260 V
	Frequency	Low frequency mode: 0–300 Hz; high frequency mode: 0–3,000 Hz
		Overload capacity

Control mode			V/F control, advanced V/F control, V/F separation control and current vector control	
Control characteristics	Frequency setting resolution	Analog input	0.1% of the maximum output frequency	
		Digital setting	0.01Hz	
	Frequency accuracy	Analog input	Within 0.2% of the maximum output frequency	
		Digital input	Within 0.01% of the set output frequency	
	V/F control	V/F curve (voltage frequency characteristics)	The reference frequency can be set arbitrarily between 5 Hz and 600 Hz and the multi-point V/F curve can be set arbitrarily. Various fixed curves such as constant torque, low reduction torque 1, low reduction torque 2 and square torque can also be selected.	
		Torque boost	Manual setting: 0.0–30.0% of the rated output Automatic lift: The lift torque is automatically determined according to the output current in combination with the motor parameters.	
		Automatic current and voltage limiting	In the process of acceleration, deceleration or stable operation, the current and voltage of the motor stator are automatically detected and suppressed within the allowable range according to a unique algorithm, and the possibility of fault tripping of the system is minimized.	

HYB3 Universal Vector Frequency Converter

Functions and Characteristics

		Voltage frequency characteristics	The output voltage-frequency ratio is automatically adjusted according to motor parameters and a unique algorithm.
Control characteristics	Non-inductive vector control	Torque features	Starting torque: 150% of rated torque at 3.0 Hz (VF control) 180% of rated torque at 0.5 Hz (PG-free current vector control and magnetic flux vector control) 180% of rated torque at 0.05 Hz (PG-provided current vector control) Running speed steady-state accuracy: $\leq \pm 0.2\%$ rated synchronous speed Speed fluctuations: $\leq \pm 0.5\%$ rated synchronous speed Torque response: ≤ 50 ms PG-provided vector control, PG-free vector control and magnetic flux vector control ≤ 20 ms
		Motor parameter self-determination	Be free of any restriction. The automatic detection of parameters can be completed under the static and dynamic conditions of the motor to obtain the best control effect.
		Current and voltage rejection	Current closed-loop control is conducted in the whole process. Current impact is completely avoided, and it has the perfect overcurrent and overvoltage suppression function.
	Undervoltage suppression during the operation	Be especially for users with low grid voltage and frequent grid voltage fluctuations. Even if the voltage is lower than the allowable voltage range, the system can maintain the longest possible running time according to a unique algorithm and the residual energy distribution strategy.	
Typical functions	Multi-segment speed and frequency wobbling operation		16-segment programmable multi-segment speed control and multiple operation modes are optional. Frequency wobbling operation: Adjustable preset frequency and center frequency, and state memory and recovery after power failure
	PID controls RS485 communication		Built-in PID controller (preset frequency). Standard configuration of the RS485 communication function, a variety of communication protocols optional, and with the linkage synchronization control function
		Analog input	DC voltage 0–10 V, DC current 0–20 mA (upper and lower limits are optional)
	Frequency setting	Digital input	Operation panel setting, RS485 interface setting, UP/DW terminal control, and various combination settings with analog input
	Output signal	Digital output	2 OC outputs and 1 fault relay output (TA, TB and TC), up to 16 meaning options
		Analog output	2 analog signal outputs; the output range can be set flexibly between 0 mA and 20 mA or 0 V and 10 V, which can realize the output of physical quantities such as set frequency and output frequency.
	Automatic voltage stabilization operation		According to the needs, three ways including dynamic voltage stabilization, static voltage stabilization and no voltage stabilization can be selected to obtain the most stable operation effect.
Acceleration and deceleration time setting		0.1 s–3,600 min continuous setting can be realized, and S type and linear modes are optional.	

HYB3 Universal Vector Frequency Converter

Functions and Characteristics

Typical functions	Braking	Dynamic braking	The starting voltage, hysteresis voltage and dynamic braking rate of the dynamic braking are continuously adjustable.
		DC braking	Start frequency of DC braking at stop: 0.00–[F0.16] upper limiting frequency Braking time: 0.0–100.0 s; braking current: 0.0%–150.0% rated current
		Magnetic flux braking	0–1,000: Ineffective
	Low noise operation		The carrier frequency is continuously adjustable from 1.0 KHz to 16.0 KHz to minimize the motor noise.
	Speed tracking restart function		It can realize the smooth restart function and the instantaneous stop restart function of the motor in operation.
	Counter		One internal counter for easy system integration
Operation function		Upper and lower limiting frequency setting, frequency hopping operation, reverse operation limit, slip frequency compensation, RS485 communication, frequency increase and decrease control, fault self-recovery operation, etc.	
Display	Operation panel display	Operating condition	Output frequency, output current, output voltage, motor speed, set frequency, module temperature, PID setting, amount of feedback, analog input and output, etc.
		Alarm content	The last six fault records and records of 6 operating parameters including output frequency, set frequency, output current, output voltage, DC voltage and module temperature during the latest fault trip
Protection function			Overcurrent, overvoltage, undervoltage, module failure, electronic thermal relay, overheating, short circuit, input and output phase loss, abnormal motor parameter tuning, internal memory failure, etc.
Environment	Ambient temperature		-10°C–+40°C (when the ambient temperature is 40°C–50°C, please use with derating)
	Ambient humidity		5%–95% RH, without condensation
	Surrounding environment		Indoor (there is no direct sunlight, corrosion, flammable gas, oil mist, dust, etc.)
	Altitude		When the altitude is above 1,000 meters, please use with derating; and derate 10% for rise of every 1,000 meters.
Structure	Protection degree		IP20
	Cooling mode		Air cooling, with fan control
Mounting type			Wall-mounted type and cabinet type

Product Outline and Installation Dimensions

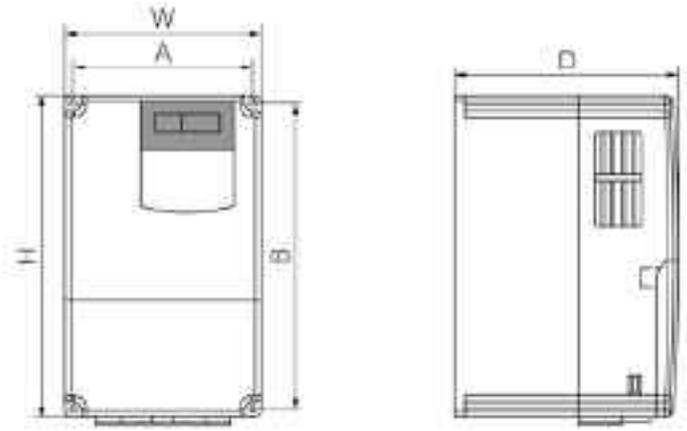


Figure A-1 Outline dimensions of 7.5 kW and below models

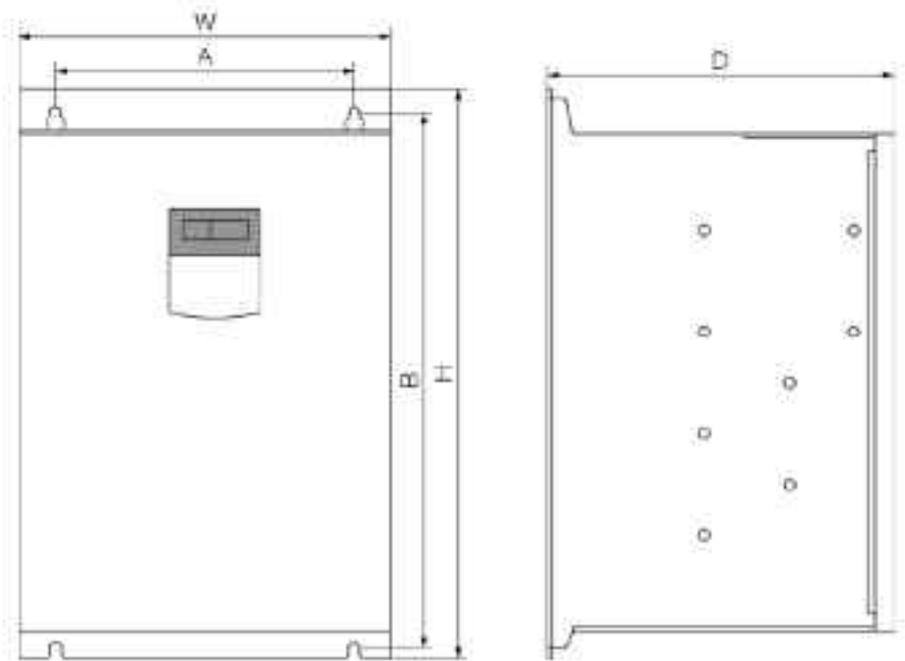


Figure A-2 Outline dimensions of 22-132 kW models (380 V)

HYB3 Universal Vector Frequency Converter

Functions and Characteristics

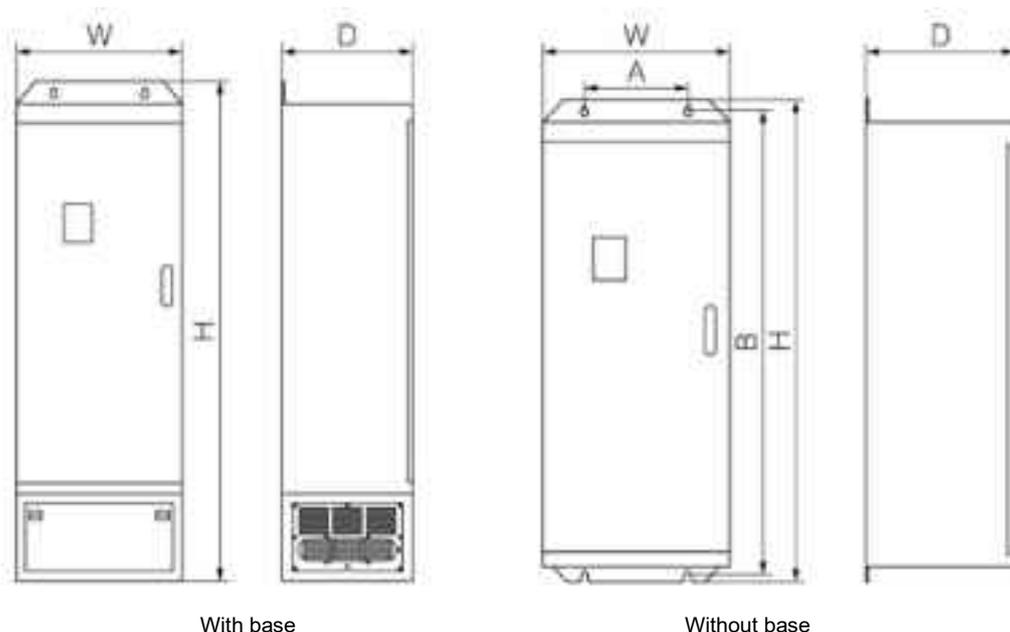


Figure A-3 Outline dimensions of 160–350 kW models (380 V)

Power (kW)	Installation dimension		Outline dimension			Mounting bore diameter (mm)	Notes
	A(mm)	B(mm)	H(mm)	W(mm)	D(mm)		
0.75 ~ 2.2	115	175	185	125	160	4	—
4.0 ~ 7.5	136	230	246	150	179	5	—
11 ~ 18.5	201	306	320	218	218	5	—
22	150	404	420	235	210	6.5	—
30 ~ 37	195	433	460	270	220	8	—
45 ~ 55	240	537	565	320	275	8	—
75 ~ 110	274	642	670	380	272	8	—
132	320	738	756	460	345	8	—
160~220	270	1233	1275	490	405	12	Without base
			1448	490	405		With base
250~350	500	1325	1362	750	415	12	Without base
			1670	750	415		With base



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