

XINJE

EtherCAT®

High Speed EtherCAT Bus



## Frequency Conversion System VH6 / VH5

High speed bus • Energy saving and environmental protection • Rich expansion functions



XINJE Wechat

XINJE

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# VH6 fully functional closed-loop vector inverter

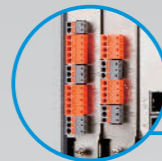
VH6 series is a fully functional closed-loop vector converter developed by Xinje company. The product adopts vector control technology, which realizes the open-loop and closed-loop vector control of asynchronous and synchronous motors, and also strengthens the reliability and environmental adaptability of the product. In addition, the product provides a wealth of expansion cards for customers to choose from to meet customers' diversified needs.

## Panel



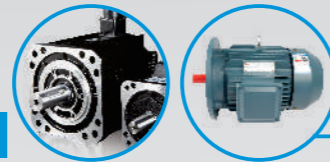
- LCD and LED keyboard are rich in information and convenient for debugging
- It has multi-functional combination keys, which can realize remote and local switching, emergency shutdown, etc
- The LCD panel contains a parameter storage chip, which is convenient for users to store, upload and download parameters. It is especially suitable for batch supporting customers, which can greatly save debugging time and improve installation efficiency
- Support up to 5m extension cable

## I/O Expansion Card

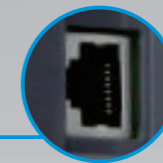


- I/O terminals with different functions are designed in different colors, which greatly reduces the probability of user wiring errors
- The terminals are pluggable for easy maintenance and replacement
- Quick wiring of spring terminals, no need to worry about screw slip

## Motor adaptability

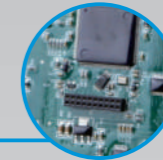


- Support asynchronous motor, synchronous motor
- Support three control modes VVF / open loop vector / closed loop vector



## Multifunctional Network Port

- Connect the LCD panel to realize dialogue interaction
- Connect the debugging software, observe the motion waveform and effectively analyze the problem
- The inverter software is easy to upgrade



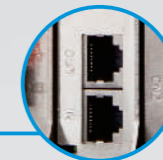
## Appearance and protection

- The new narrow book body design saves installation space
- EMC and high protection design, stable operation of equipment
- The built-in circuit board has enhanced protection, which can effectively resist the harsh environment such as humidity, corrosion and dust



## PG card feedback

- Support photoelectric encoder and rotary encoder, suitable for high-precision driving occasions
- PG card supports 0 to 63 arbitrary frequency division multiple output
- Support differential, collector and push-pull signal input

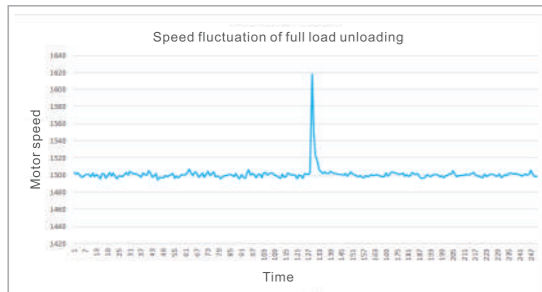


## Networking function

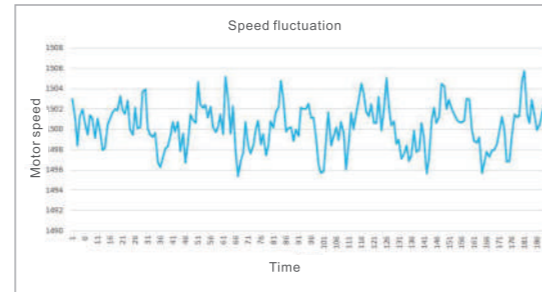
- Optional communication card CANopen and EtherCAT, networking with control products
- Modbus communication is equipped with 32 groups of customer free mapping addresses to realize continuous reading of parameters
- The two-channel network ports are in from the bottom and out from the top, with switch function, and the wiring is clean and concise

# Excellent Product Performance

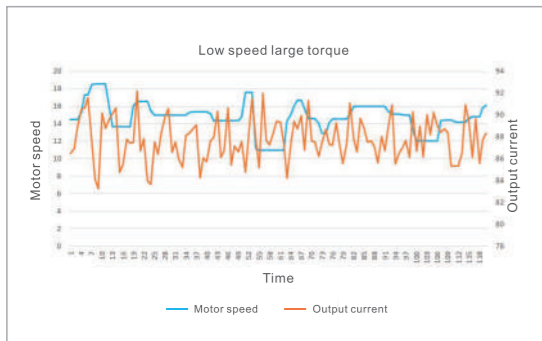
## Excellent performance



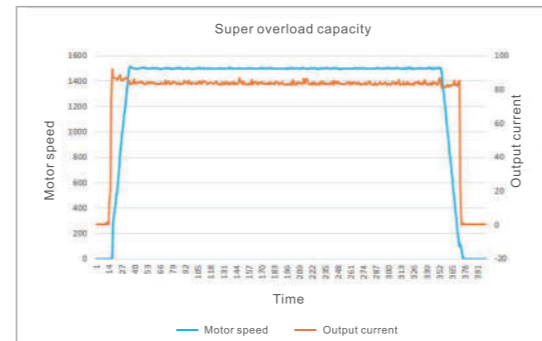
The speed fluctuation of VH6 series frequency converter driving the motor to suddenly reduce to no-load at rated torque and speed, and recovering the speed within 2 seconds.



The speed fluctuation of VH6 series frequency converter driving the motor at rated torque and speed is stable at  $\pm 0.2\%$ .

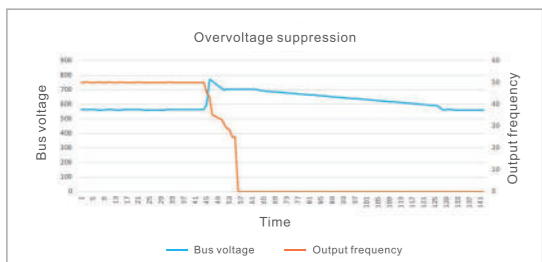


When the VH6 series frequency converter drives the motor at 0.5Hz, the torque output is as high as 180%, reflecting the strong low-frequency torque performance.

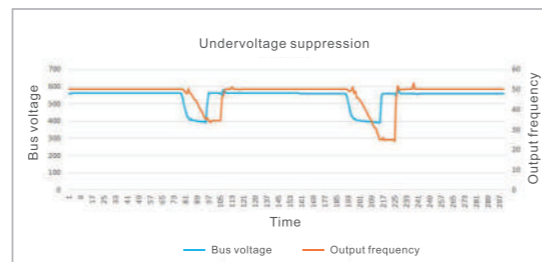


VH6 series frequency converter drives the motor to drive the load. The maximum overload can reach 180% and last for 3 seconds.

## Perfect protection mechanism



Overvoltage suppression is that when the bus voltage reaches or exceeds the bus overvoltage suppression point, the frequency converter will automatically adjust the operation frequency to suppress the rise of bus voltage, so as to ensure that the frequency converter will not cause overvoltage protection due to high bus voltage.



Undervoltage suppression is that when the bus voltage drops to the bus undervoltage suppression point, the frequency converter will automatically adjust the operation frequency, so as to ensure that the frequency converter will not report undervoltage fault due to low bus voltage in a short time. Once the power supply is restored within the validity period of undervoltage suppression, the frequency converter can continue to operate normally.

# Naming Rule

## VH6 frequency inverter naming rule

VH 6 - 4 5P5 - B  
 ① ② ③ ④ ⑤

### ① Product code

Sign	Name
VH	General frequency inverter

### ② Product series

Sign	Name
6	Fully functional closed-loop vector converter (asynchronous motor)
6S	Fully functional closed-loop vector converter (synchronous motor)

### ④ Power level

Sign	Power level (kW)
0P7	0.75
1P5	1.5
...	...
5P5	5.5
...	...
011	11
018	18.5
055	55

### ③ Input voltage level

Sign	Power supply voltage
4	380V

### ⑤ Brake unit

Sign	Brake unit
B	Built-in brake unit
Vacant	No

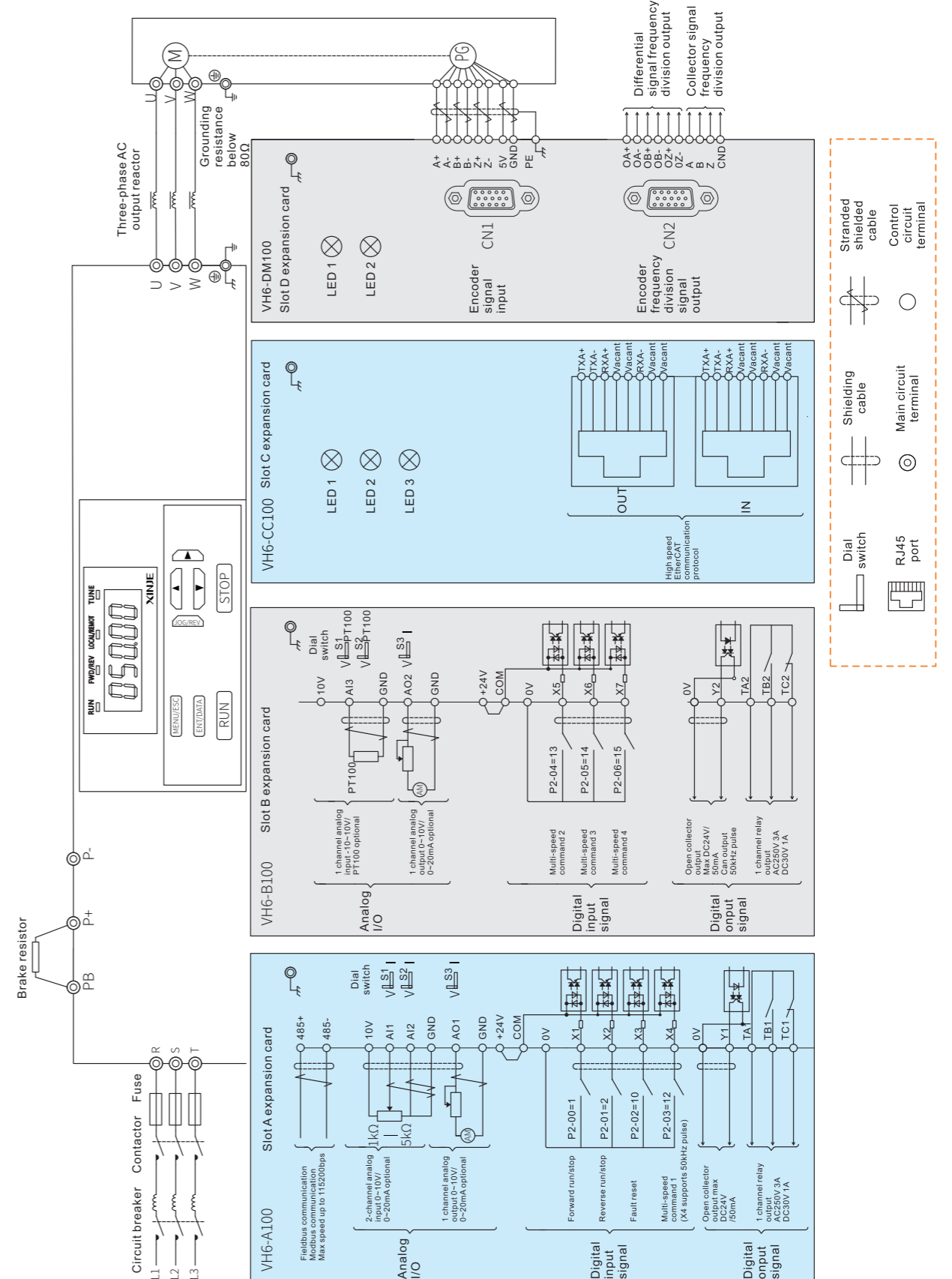
# Technical Parameters

Model	Power supply capacity (KVA)	Input current (A)	Output current (A)	Adaptive motor (kW)
Three-phase 380V 50/60Hz				
VH6-43P7-B	5.9	11.0	9.0	3.7
VH6-45P5-B	8.9	14.6	13.6	5.5
VH6-47P5-B	11.0	20.5	17.0	7.5
VH6-4011-B	17.0	26.0	25.0	11.0
VH6-4015-B	21.0	35.0	32.0	15.0
VH6-4018-B	24.0	38.5	37.0	18.5
VH6-4022-B	30.0	46.5	45.0	22.0
VH6-4030-B	40.0	62.0	60.0	30.0
VH6-4037-B	63.0	69.0	75.0	37.0
VH6-4045-B	81.0	89.0	90.0	45.0
VH6-4055-B	97.0	106.0	110.0	55.0

# Technical Specifications

Item name		VH6 high performance closed loop vector frequency inverter specification		
Power range		3.7kW~55kW		
Input	Rated voltage, frequency	Three-phase 380V: three-phase 380V, 50/60Hz		
	Allowable voltage fluctuation range	Three-phase 380V: 320~440V		
Output	Voltage	0~input voltage		
	Frequency	0~500Hz		
Control performance	Control motor type	Asynchronous motor, permanent magnet synchronous motor, variable frequency motor		
	Control mode	Vector control with speed sensor (FVC)	Vector control without speed sensor (SVC)	
	Speed precision	±0.2%	±0.5%	±1%
	Speed fluctuation	±0.2%	±0.3%	±0.5%
	Speed regulation range	1:2000	1:100	1:50
	Startup torque	0Hz:180%	0.5Hz:150%	1.0Hz:150%
	Torque accuracy	±5% rated torque	±10% rated torque	/
	Torque response	≤10ms	≤20ms	/
	Overload ability	150% rated current 60s		
	Frequency precision	Low frequency operation mode: 0.01Hz, high frequency operation mode: 0.1Hz		
	Frequency resolution	Low frequency operation mode: digital setting-- 0.01Hz, analog setting -- max frequency ×0.1% High frequency operation mode: digital setting -- 0.1Hz, analog setting -- max frequency ×0.1%		
	Control terminal input	Digital input channel	Up to 7-channel digital input X, card A has 4-channel (X1~X4), resolution is less than 2ms, card B has 3-channel (X5~X7), X4 can support max 50kHz high speed pulse input	
Analog input channel		Up to 3-channel analog input AI, card A has 2-channel (AI1, AI2), resolution is less than 20mV, card B has 1 channel (AI3). AI1, AI2 support 0~10V or 0~20mA input, AI3 support -10~10V input, can support PT100 input		
Control terminal output	Digital output channel	Up to 4-channel digital output Y, card A has 1 channel (Y1) + 1 channel (TA1TB1TC1), card B has 1 channel (Y2) + 1 channel (TA2TB2TC2). Y2 can support max 50kHz high speed pulse output		
	Analog analog channel	Up to 2-channel analog output AO, card A has 1 channel (AO1), card B has 1 channel (AO2). AO1, AO2 support the output 0~10V or 0~20mA		
Product performance	Start command given mode	Communication given (Modbus, CANopen, EtherCAT), operate panel given, terminal given		
	Frequency given mode	Communication given (Modbus, CANopen, EtherCAT), operate panel given, terminal given, analog AI given, multi-speed given, simple PLC given, PID main and auxiliary given		
	Typical function	Frequency main and auxiliary operation, no reverse rotation, torque increase, nine VF curve settings, five section AI curve settings, acceleration and deceleration curve settings, terminal delay and filtering, terminal multi-functional input and output, DC braking, dynamic braking, jog operation, 16-section speed, built-in two-channel PID, speed tracking restart, carrier modulation, fault recording, fault self reset, pre-excitation start, 30 groups of user-defined parameters		
	Important function	Carrier modulation, torque control, motor self-tuning, current limiting control, overvoltage control, undervoltage control, speed tracking, droop control, oscillation suppression, overvoltage overcurrent stall control, automatic voltage regulation (AVR), automatic energy-saving operation, etc		
	Protection function	Power on motor short circuit detection, input and output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, underload protection, overcurrent overvoltage stall protection, relay pull in protection, terminal protection, instantaneous power failure nonstop, etc		
	Dynamic braking	380V level driver: brake unit braking voltage: 650~750V. 3.7kW~55kW models have built-in brake unit, please connect brake resistor between P+ and PB		
	DC reactor	18.5kw and above models are built-in DC reactors		
	Common DC bus	Share the regenerative energy when the frequency converter decelerates, improve the braking capacity, achieve the purpose of energy saving and save the additional space and cost required by the resistance		
	Multiple bus support	Standard Modbus, can expand EtherCAT, CANopen		
	Multiple encoder support	Differential input encoder, OC input encoder, rotary encoder		
Features function	LCD panel	LCD display, parameter setting, status monitoring, parameter copy, fault analysis and location, program download, mass storage of parameters		
	Instant stop nonstop	In case of instantaneous power failure, the load feedback energy compensates for the reduction of voltage to maintain the continuous operation of the frequency converter in a short time		
	Timing control	Timing control function: time range 0.1min~6500min		
	Multi-motor switching	Two groups of motor parameters can realize the switching control of two motors		
	Motor overheating protection	AI3 supports PT100 sensor signal input		
	Flexible and diversified terminal functions	There are 51 kinds of multifunctional terminals X, 41 kinds of terminals Y, and 19 kinds of logic function options AO, which meet the requirements of general frequency converter control functions		
	Communication customization parameters	It is convenient for users to read and write the parameters of the frequency converter continuously		
Display and keyboard	Software	Rich background monitoring functions to facilitate on-site data acquisition and debugging		
	Keyboard display	It can display the set frequency, output frequency, output voltage, output current, input and output status and other parameters		
	Key lock	Realize partial or full locking of keys to prevent false triggering		
	Parameter copy	Standard LED display digital potentiometer keyboard, optional LCD English display keyboard (parameter upload/download)		
Environment	Optional accessories	LCD keyboard, communication card (EtherCAT, CANopen), encoder PG card (incremental pulse, resolver)		
	Place of use	Indoor, free from direct sunlight, no dust, corrosive gas, combustible gas, oil mist, water vapor, drip or salt		
	Altitude	Less than 1000m (When it is higher than 1000m, the output current needs to be reduced by about 10% of the rated current for each increase of 1000m)		
	Ambient temperature	-10°C~+40°C (please derate to use or enhance the heat dissipation when ambient temperature is 40°C~50°C)		
	Ambient humidity	Less than 95%RH, no condensation of water droplets		
	Vibration	Less than 5.9m/s <sup>2</sup> (0.6g)		
	Storage temperature	-40°C~+70°C		
	Protection level	IP20		
	Cooling mode	Forced air cooling		
	Installation mode	Wall mounted and embedded		

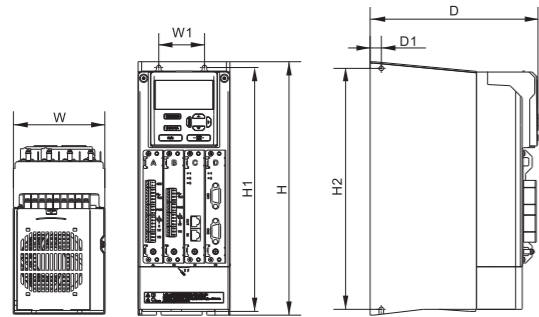
# Terminal Wiring Diagram



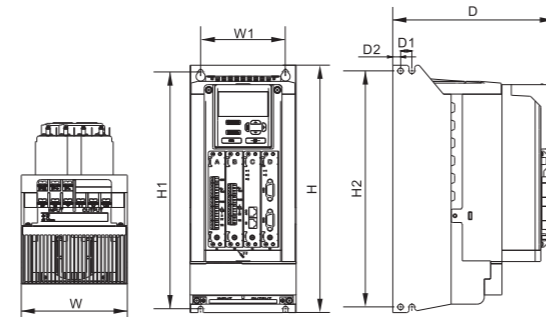
# Installation Dimension

(Unit: mm)

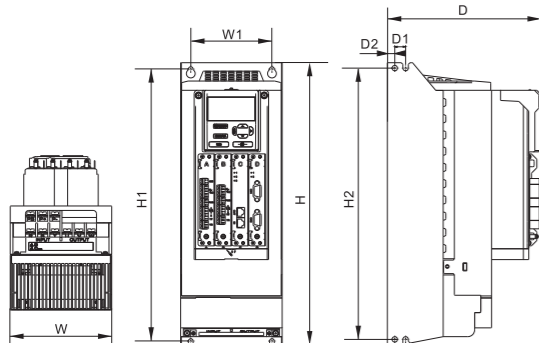
X1 model: 3.7~7.5kW



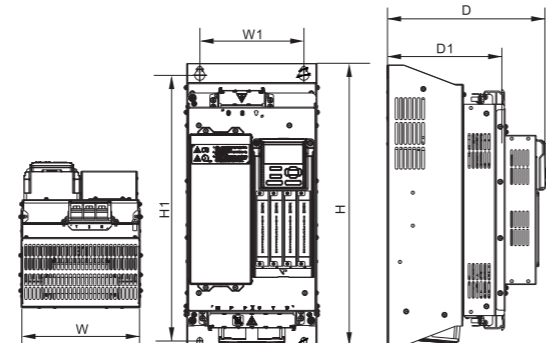
X2 model: 11~15kW



X3 model: 18~30kW

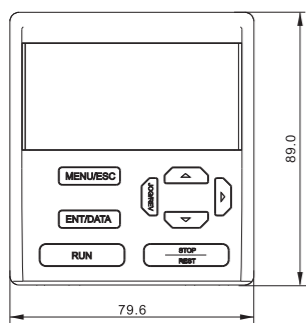


X4 model: 37~55kW

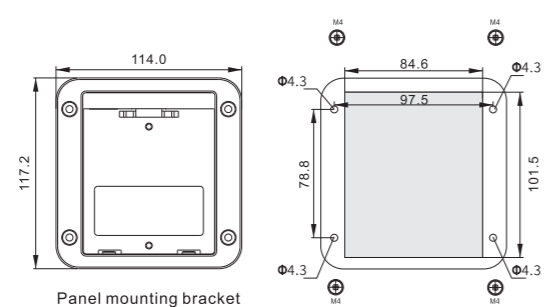


Voltage level	Driver model	Overall installation dimension (width*height*depth)									Mounting screw specification	Weight (Kg)
		Body code	W	H	D	W1	H1	H2	D1	D2		
380V	VH6-43P7-B	X1	110	305	202	55	290	290	14	/	M5	4
	VH6-45P5-B											
	VH6-47P5-B											
	VH6-4011-B	X2	150	350	228	120	335	334	27	11	M6	5.7
	VH6-4015-B											
	VH6-4018-B											
	VH6-4022-B	X3	150	417	228	120	402	402	27	11	M6	10
	VH6-4030-B											
	VH6-4037-B											
VH6-4045-B	X4	235.6	510	287.9	188	490	/	213.9	/	M8	/	
VH6-4055-B												

## Panel dimension



## Panel mounting bracket drawing



### Panel mounting bracket description

The gray area is the hollowed out part, the hollowed out area in the middle is 84.6×101.5, and the hollowed out area at the four corners is a circle with a diameter of 4.34. Put M4 screws to fix the bracket on the door panel.

# Accessory Description

## Standard I/O card VH6-A100



1 channel RS485 communication + 2 channels AI + 1 channel AO + 4 channels bipolar input + 1 channel YT + 1 channel YR

## Expansion I/O card VH6-B100



1 channel AI + 1 channel AO + 3 channels bipolar input + 1 channel YT + 1 channel YR

## CANopen communication card VH6-CN100



The expansion interface card specially designed for CANopen protocol is suitable for Xinje frequency converter. Xinje frequency converter can be connected to CANopen network and exist as a slave station through this card.

## EtherCAT communication card VH6-CC100



The expansion interface card specially designed for EtherCAT protocol is suitable for Xinje frequency converter. Xinje frequency converter can be connected to EtherCAT network and exist as a slave station through this card.

## Simple incremental encoder PG card VH6-DM200



It is used for receiving and detecting motor encoder signal by frequency converter. The frequency converter can control the motor speed and torque more accurately. The types of encoder signals that this PG card can receive are: differential type, NPN collector open circuit, push-pull type. However, this PG card does not support frequency division output function.

## LCD panel VH6-PE100

The panel is LED display, which can set parameters, monitor the operation status of the frequency converter and operate the frequency converter.



## Upper computer connection cable JC-EV-15

To connect the frequency inverter and PC, to connect the frequency inverter software and update the firmware.



## Panel expansion cable JC-RD-20

The extension cable of the operation panel is a standard network cable, which only provides 2 or 3 meters. Users can also make other lengths of network cables by themselves.



## Mounting base VH6-DPANEL

Base of VH6 frequency converter operation panel during extension installation. Model: VH6-DPANEL



## LCD panel VH-PC100

The panel adopts LCD display, which can set parameters, upload and download parameters, monitor the operation status of the frequency converter, and facilitate the debugging of the frequency converter.



## Typical Application Industry

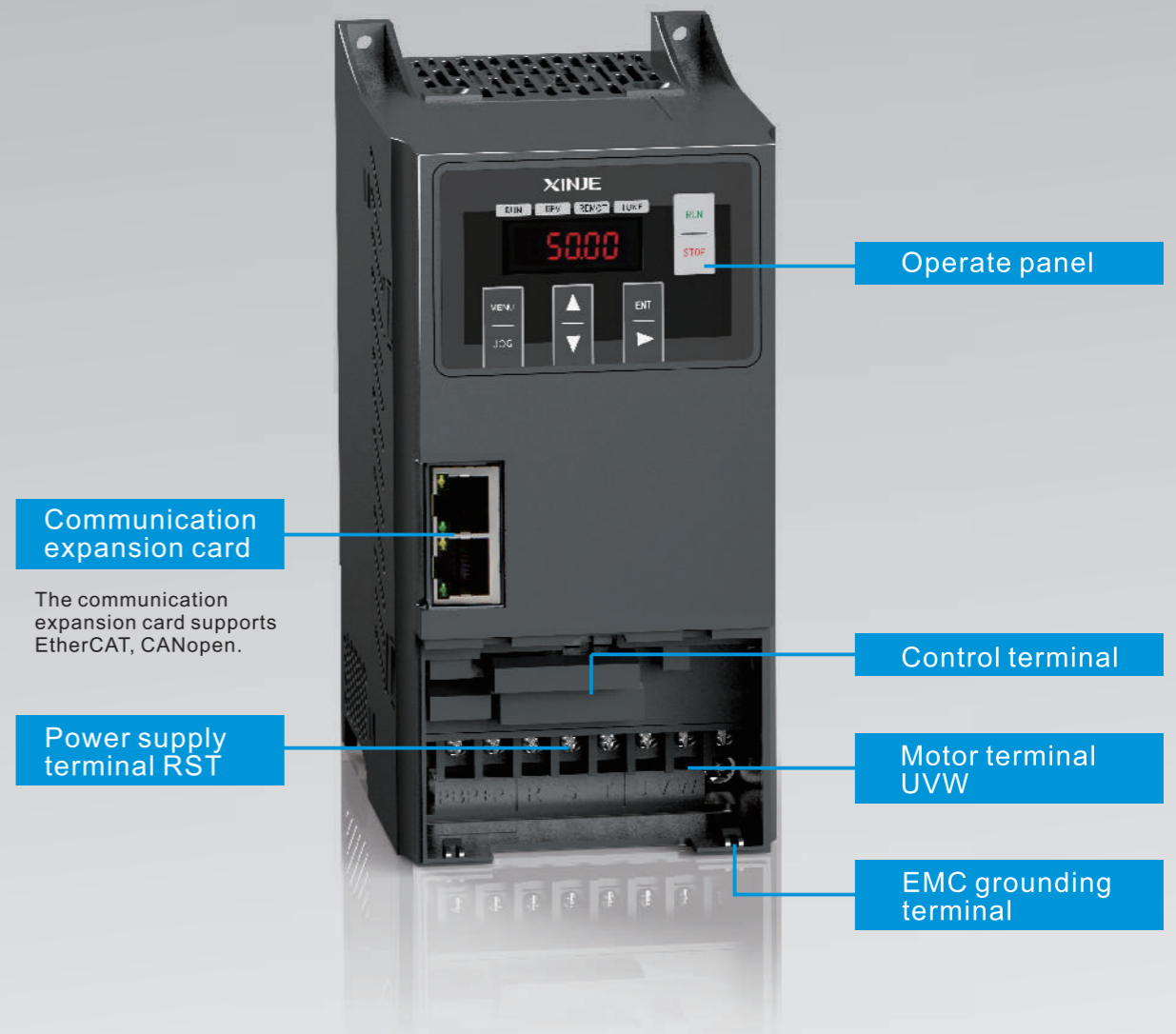
It is applicable to machine tools, air compressors, papermaking, oil fields, municipal engineering, plastic machinery industry, metal processing, textile industry, printing and packaging, ceramic machinery, wood processing, cable processing, sewage treatment and other fields.



## VH5 general type open loop vector frequency inverter

VH5 series is a general-purpose open-loop vector frequency converter developed by Xinje company. It has the remarkable characteristics of small volume, better cost performance and high reliability. At the same time, VH5 series can be combined with communication expansion card to realize EtherCAT, CANopen and other high-speed bus networking.

VH5 can be widely used in automatic production lines, textile, woodworking, engraving machines, logistics equipment, food filling, food packaging and other miniaturized mechanical equipment.



VH5 frequency converter is equipped with one RS485 communication port as standard. In addition, it can be added to EtherCAT and CANopen networks through the special communication expansion card and exist as a slave station.

# Excellent Product Performance



# Naming Rule

## VH5 frequency inverter naming rule

VH 5 - 4 0P7 - B  
 ① ② ③ ④ ⑤

① Product code		② Product series		③ Input voltage level		④ Power level	
Sign	Name	Sign	Name	Sign	Power supply voltage	Sign	Power level (kW)
VH	Frequency inverter	5	General type open loop vector frequency inverter	4	380V	0P7	0.75
				2	220V	1P5	1.5
						...	...
						5P5	5.5

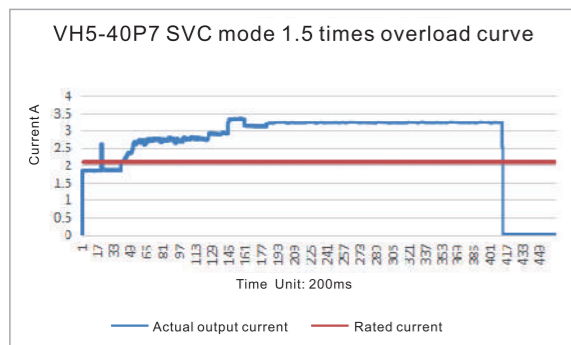
  

④ Brake unit	
Sign	Brake unit
B	Built-in brake unit
Vacant	No

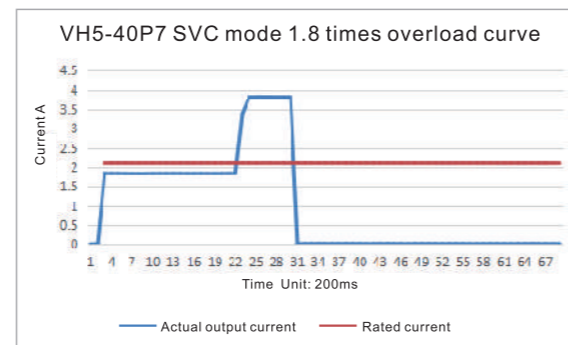
# Technical Parameter

Model	Power supply capacity (KVA)	Input current (A)	Output current (A)	Adaptive motor (kW)
Single phase 220V 50/60Hz				
VH5-20P7-B	1.5	5.6	4.7	0.75
VH5-21P5-B	3.0	9.3	7.5	1.5
VH5-22P2-B	4.5	12.7	10.0	2.2
Three-phase 380V 50/60Hz				
VH5-40P7-B	1.5	3.4	2.1	0.75
VH5-41P5-B	3.0	5.0	3.8	1.5
VH5-42P2-B	4.0	5.8	5.1	2.2
VH5-43P7-B	5.9	10.5	9.0	3.7
VH5-45P5-B	8.9	14.6	13.0	5.5

## Overload ability

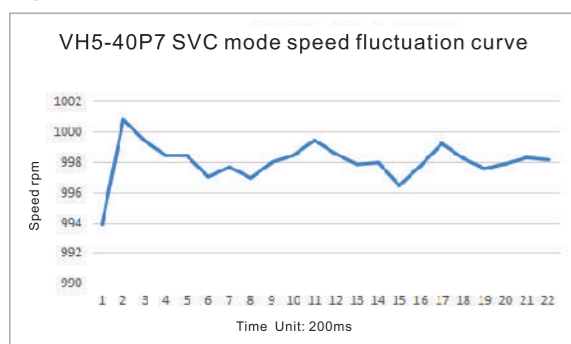


VH5 frequency converter 1.5 times overload time 60 seconds



VH5 frequency converter 1.8 times overload time 1 second

## Speed fluctuation

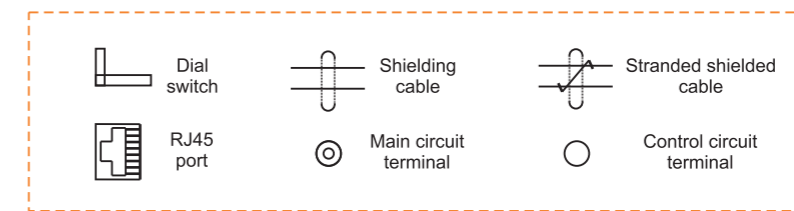
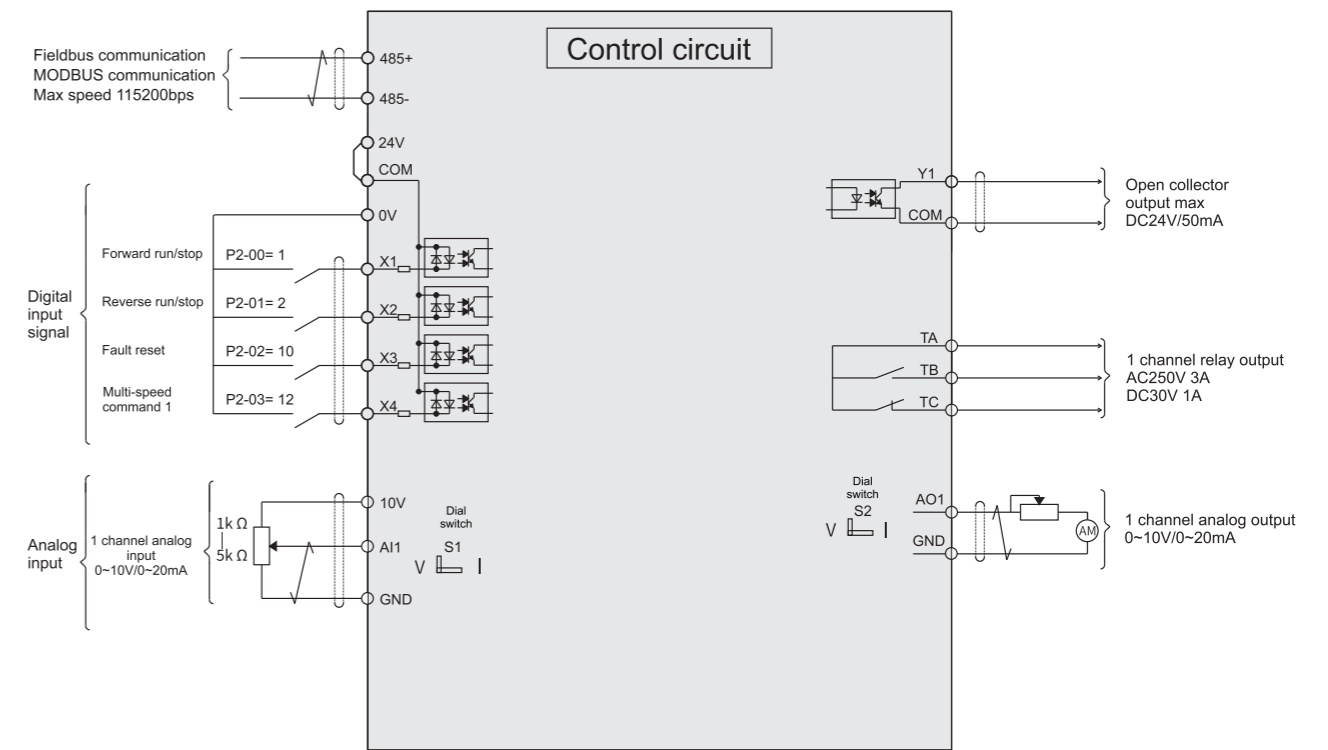
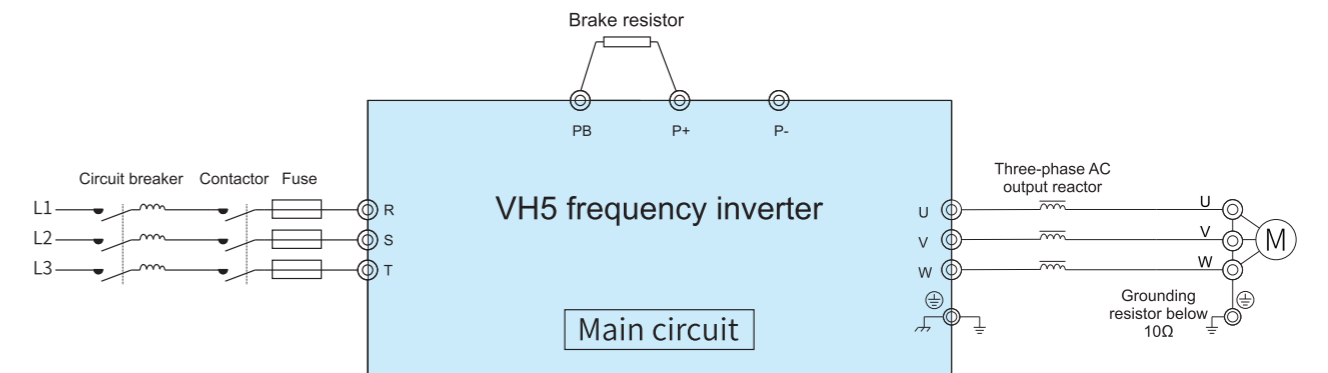


VH5 frequency inverter speed fluctuation ±0.3%

# Technical specifications

Item name	VH5 general type open loop vector frequency inverter		
Power range	0.75kW~5.5kW		
Input	Rated voltage, frequency	3AC 380V;50/60Hz	3AC 220V;50/60Hz 1AC 220V;50/60Hz
	Allowable voltage fluctuation range	±15%	
Output	Voltage	0~input voltage	
	Frequency	0~300Hz	
Control performance	Control motor type	Asynchronous motor	
	Control mode	Vector control without speed sensor (SVC)	V/F control (VVF)
	Speed precision	±0.5%	±1%
	Speed fluctuation	±0.3%	±0.5%
	Speed regulation range	1:100	1:50
	Startup torque	0.5Hz:150%	1.0Hz:150%
	Torque accuracy	±10% rated torque	/
	Torque response	≤20ms	/
	Overload ability	150% rated current 60s, 180% rated current 10s, 200% rated current 2s	
	Frequency precision	0.01Hz	
	Frequency resolution	Digital setting -- 0.01Hz, analog setting -- max frequency ×0.1%	
	Control terminal input	Digital input channel Standard: 4 digital X bipolar input terminals	
Control terminal output	Analog input channel	Standard: 1 analog input terminal AI1, support 0~10V or 0~20mA	
	Digital output channel	Standard: 1 multi-functional Y1 output terminal, 1 group TA TB TC relay output terminal	
Product function	Analog output channel	Standard: 1 analog output terminal AO1, support 0~10V or 0~20mA	
	Start command given mode	Communication given (Modbus, CANopen, EtherCAT), operate panel given, terminal given	
	Frequency given mode	Communication given (Modbus, CANopen, EtherCAT), operate panel given, terminal given, analog AI given, multi-speed given, simple PLC given, PID main and auxiliary given	
	Typical function	Frequency main and auxiliary operation, no reverse rotation, torque increase, nine VF curve settings, five section AI curve settings, acceleration and deceleration curve settings, terminal delay and filtering, terminal multi-functional input and output, DC braking, dynamic braking, jog operation, 16-section speed, built-in two-channel PID, speed tracking restart, carrier modulation, fault recording, fault self reset, pre-excitation start, 30 groups of user-defined parameters	
	Important function	Carrier modulation, torque control, motor self-tuning, current limiting control, overvoltage control, undervoltage control, speed tracking, droop control, oscillation suppression, overvoltage overcurrent stall control, automatic voltage regulation (AVR), automatic energy-saving operation, etc	
	Protection function	Power on motor short circuit detection, input and output phase loss protection, overcurrent protection, overvoltage protection, undervoltage protection, overheat protection, overload protection, underload protection, overcurrent overvoltage stall protection, relay pull in protection, terminal protection, instantaneous power failure nonstop, etc	
	Dynamic braking	Built-in brake unit, please select suitable brake resistor	
	Multiple bus support	Standard Modbus, can expand EtherCAT, CANopen	
	Multiple encoder support	LCD display, parameter setting, status monitoring, parameter copy, fault analysis and location, program download, mass storage of parameters	
	Instant stop nonstop	In case of instantaneous power failure, the load feedback energy compensates for the reduction of voltage to maintain the continuous operation of the frequency converter in a short time	
Features function	Timing control	Timing control function: time range 0.1min~6500min	
	Multi-motor switching	Two groups of motor parameters can realize the switching control of two motors	
	Flexible and diversified terminal functions	There are 51 kinds of multifunctional terminals X, 41 kinds of terminals Y, and 19 kinds of logic function options AO, which meet the requirements of general frequency converter control functions	
	Communication customization parameters	It is convenient for users to read and write the parameters of the frequency converter continuously	
	Software	Rich background monitoring functions to facilitate on-site data acquisition and debugging	
Display and keyboard	Keyboard display	It can display the set frequency, output frequency, output voltage, output current, input and output status and other parameters	
	Key lock	Realize partial or full locking of keys to prevent false triggering	
	Parameter copy	Standard LED display digital potentiometer keyboard, optional LCD English display keyboard (parameter upload/download)	
	Optional accessories	LCD keyboard, communication card (EtherCAT, CANopen)	
Environment	Place of use	Indoor, free from direct sunlight, no dust, corrosive gas, combustible gas, oil mist, water vapor, drip or salt	
	Altitude	Less than 1000m (When it is higher than 1000m, the output current needs to be reduced by about 10% of the rated current for each increase of 1000m)	
	Ambient temperature	-10°C~+40°C (please derate to use or enhance the heat dissipation when ambient temperature is 40°C~50°C)	
	Ambient humidity	Less than 95%RH, no condensation of water droplets	
	Vibration	Less than 5.9m/s <sup>2</sup> (0.6g)	
	Storage temperature	-40°C~+70°C	
	Protection level	IP20	
Cooling mode	Forced air cooling		
Installation mode	Wall mounted and embedded		

# Terminal wiring diagram



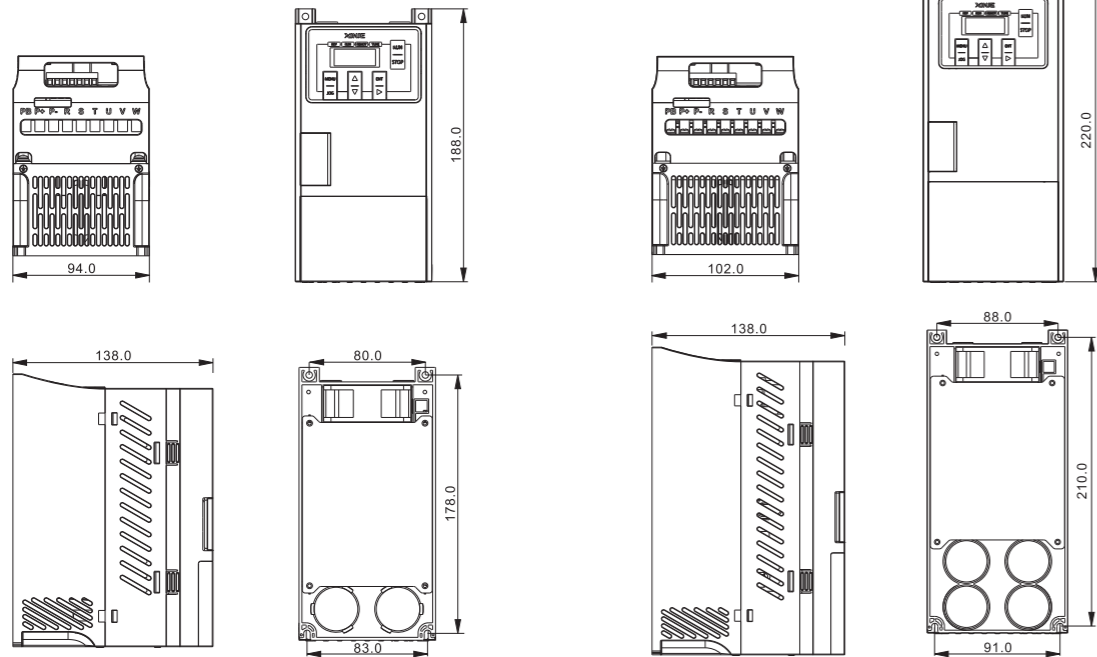


# Installation Dimension Drawing

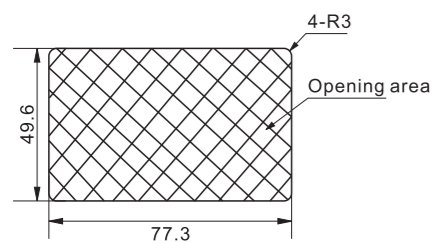
(Unit: mm)

VH5-20P7/21P5/22P2/40P7/41P5/42P2/43P7-B

VH5-45P5-B



## Take out the panel

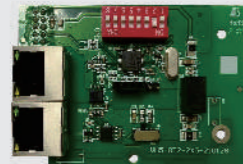


The panel of VH5 series frequency converter can be taken out, and the user can install the panel in the slot according to the opening size provided on the left.

# Accessory Description

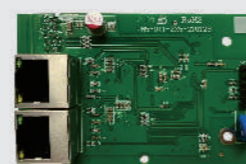
## CANopen communication card VH5-CN100

The expansion interface card specially designed for CANopen protocol is suitable for Xinje frequency converter. Xinje frequency converter can be connected to CANopen network and exist as a slave station through this card.



## EtherCAT communication card VH5-CC100

The expansion interface card specially designed for EtherCAT protocol is suitable for Xinje frequency converter. Xinje frequency converter can be connected to EtherCAT network and exist as a slave station through this card.



# VH rectifier braking module

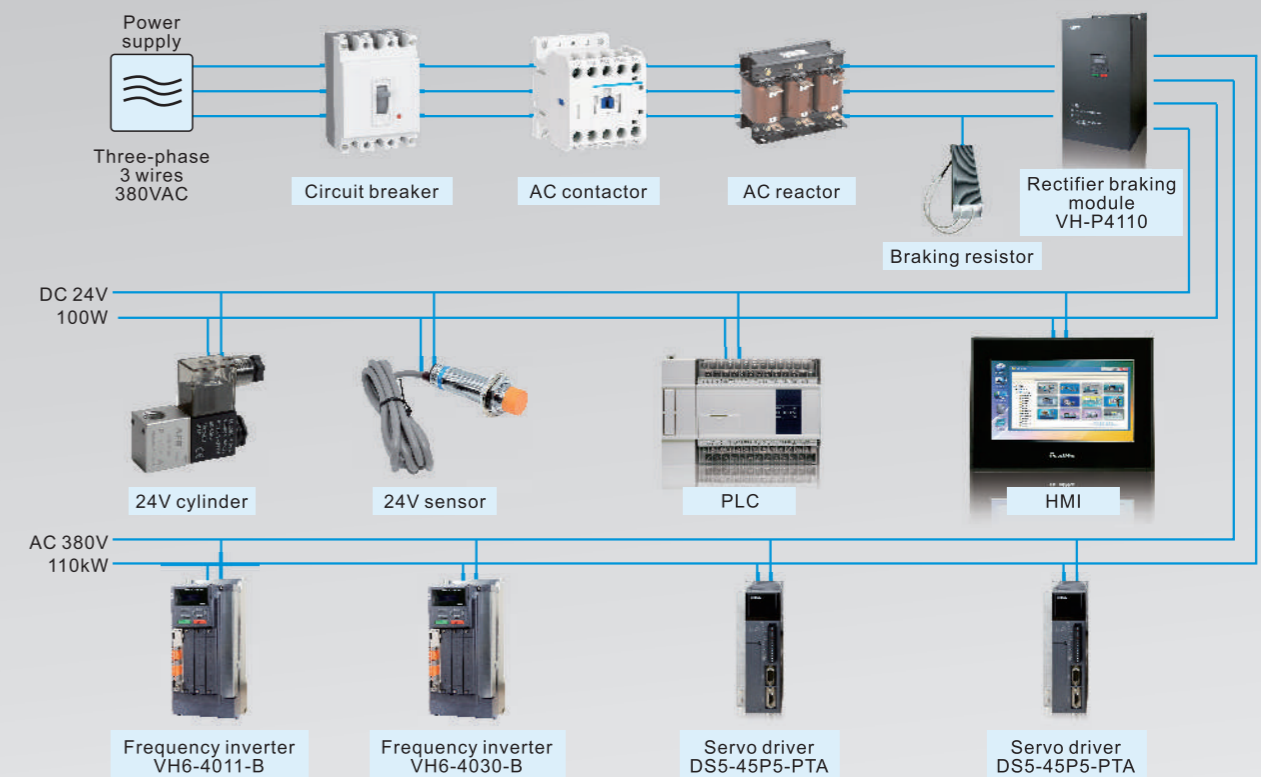
VH series rectifier braking module is mainly used in occasions where DC common bus is required for drive products such as frequency converter or servo.

Two functions of rectifier braking unit composing the common bus:

- Energy conservation and environmental protection, power recovery
- Stable and reliable operation to avoid losses caused by accidental power failure and shutdown



## DC common bus system topology



\*Note: The VH rectifier module inputs AC380V voltage, which can provide electric energy for the following products after rectification:  
1. 380V frequency converter, servo driver, and the total load power shall not exceed the rated power of the module.  
2. DC 24V PLC, HMI, cylinder, sensor, stepping driver, the maximum power shall not exceed 100W.

## Application device type:

Double twister, slitter, drawing machine, non-woven production line and other types of equipment.

# Naming Rule

## Naming rules of rectifier braking module

VH - P 4 110

- ① Product code
- ② Rectifier braking module
- ③ Input voltage level
- ④ Power level of rectifier module

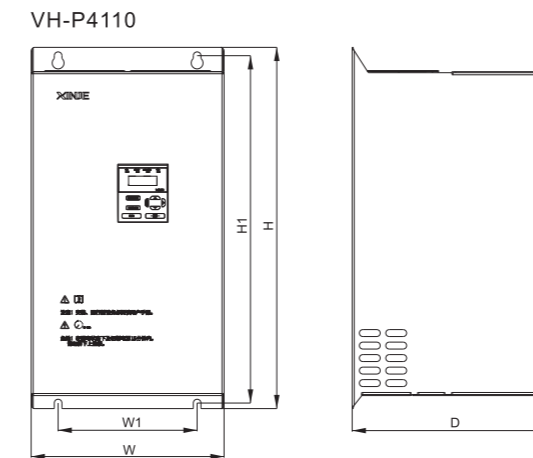
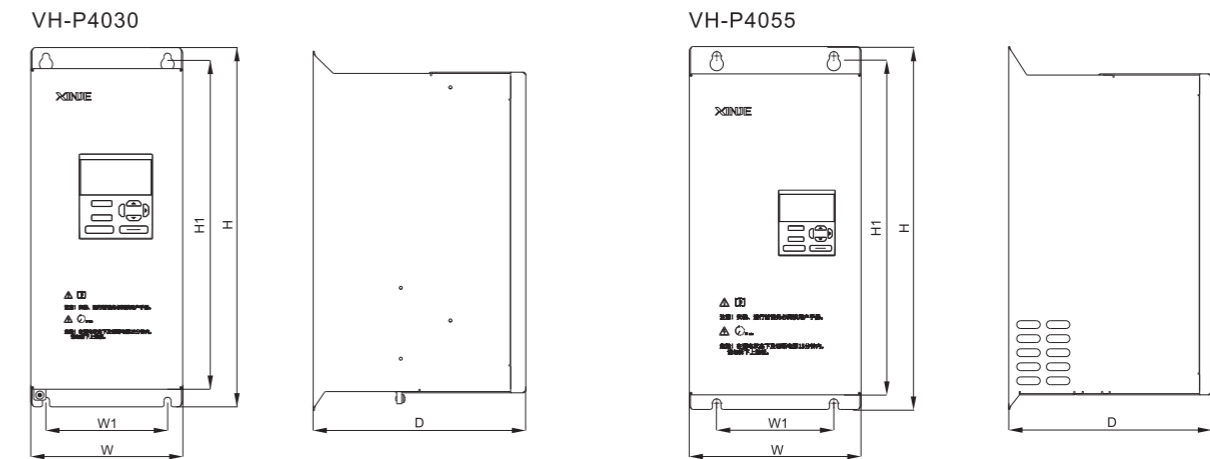
Sign	Name	Sign	Name	Sign	Power supply voltage	Sign	Power level (kW)
VH	VH series	P	Rectifier braking module	4	380V	030	30
						055	55
						110	110

# Model and Technical Parameters of Rectifier Braking Module

Model of rectifier braking module		VH-P4110	VH-P4055	VH-P4030
Input	Rated power (kW)	110	55	30
	Input current (A)	220	112	68
	Input voltage (ACV)	380V;50Hz/60Hz		
	Power supply capacity (KVA)	180	85	55
Output	Output current (DCA)	120	100	44
	Output voltage (DCV)	537	530	531
Braking	Rated continuous braking current (A)	50	40	40
	Max peak braking current (A)	110	100	50
	Recommended rated braking resistor (Ω)	11kW / 10Ω	9kW / 13Ω	5kW / 20Ω
	Min braking resistor	7Ω	10Ω	16Ω

# Installation dimension drawing

(Unit: mm)



Model of rectifier braking module	Overall installation dimension (width×height×depth)				
	W	W1	D	H	H1
VH-P4030	150	120	210	355	340
VH-P4055	220	150	260	465	445
VH-P4110	277.6	200	290	520	500