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V800 Series High–performance Vector AC Drive

Inverter | Servo drive | Servo motor | PLC | HMI

Simphoenix

We are devoted to be remarkable automation product and solution provider

Enterprise mission

Continue to create value for customers

Enterprise vision

A remarkable automation product and solution provider

Enterprise spirit

Innovation and initiative

Core value

Integrity, mutual benefit, pragmatism, dedication

Business Concepts

People-oriented, common progress

Enterprise headquarters

Overseas sales network

Domestic sales and services network

5 Regions

Nearly 15 Overseas sales networks

35 Offices in China covering the domestic sales and service network, can respond to customer needs in time

www.simphoenix.com.cn

Established in 2004, Shenzhen Simphoenix Electric Technology Co.,Ltd is committed to be a reliable industrial automation product and solution provider in China. Simphoenix is specialized in the R&D, manufacturing, sales and service of industrial automation products, mainly include inverter, servo drive, servo motor, PLC, HMI, etc.

Trough more than 10 years' development, Simphoenix has become a well-known domestic brand for its complete product structure and strong R&D capacity.

V800 Series High-performance Vector inverter

Based on the powerful solution ability of the new generation control platform, the V800 series high-performance vector inverter adopts modular design of software and hardware, which has the characteristics of compact structure, beauty appearance, excellent performance, reliable quality and extensive application.

This series of inverters can easily handle a variety of complex applications with its flexible application parameter configuration and varied expansion boards, enabling each customer can become an expert in the inverter industry.

Typical Application

It can be widely used in printing, packaging, textile, transmission, cable, machine tools, medical equipment, lifting machinery and other industries.

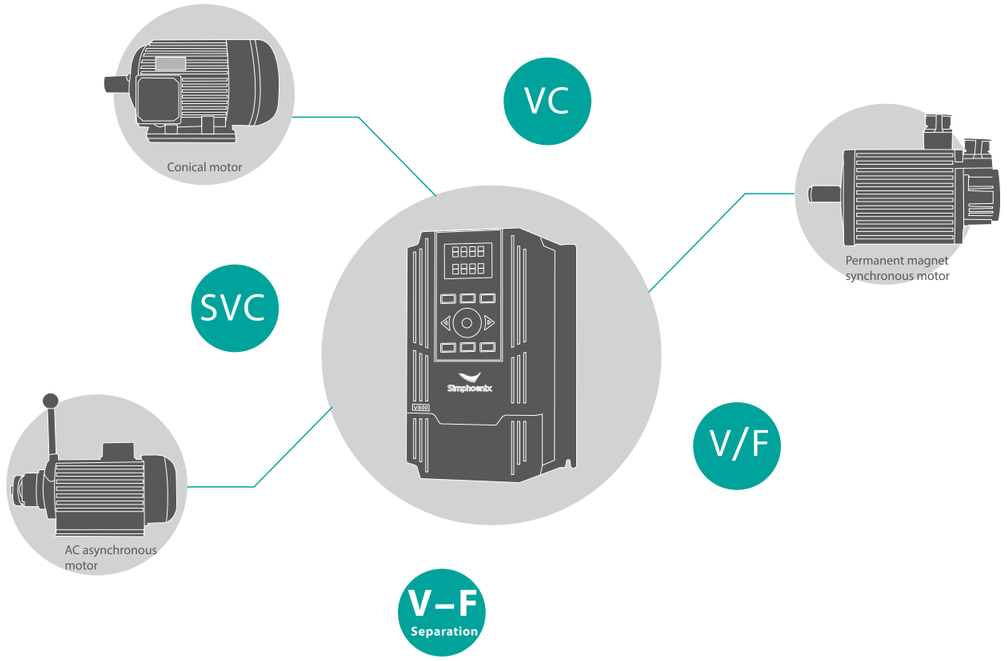



Excellent performance

Inherit the excellent performance and stable quality of the previous generation, can meet the needs of more users in varied industries.

Richer control algorithms

- Increase leading permanent magnet synchronous motor control algorithm
- Have servo positioning function, which can realize simple servo function such as spindle arbitrary angle positioning, pulse control, stop angle setting, etc.



Faster torque response ,higher speed accuracy

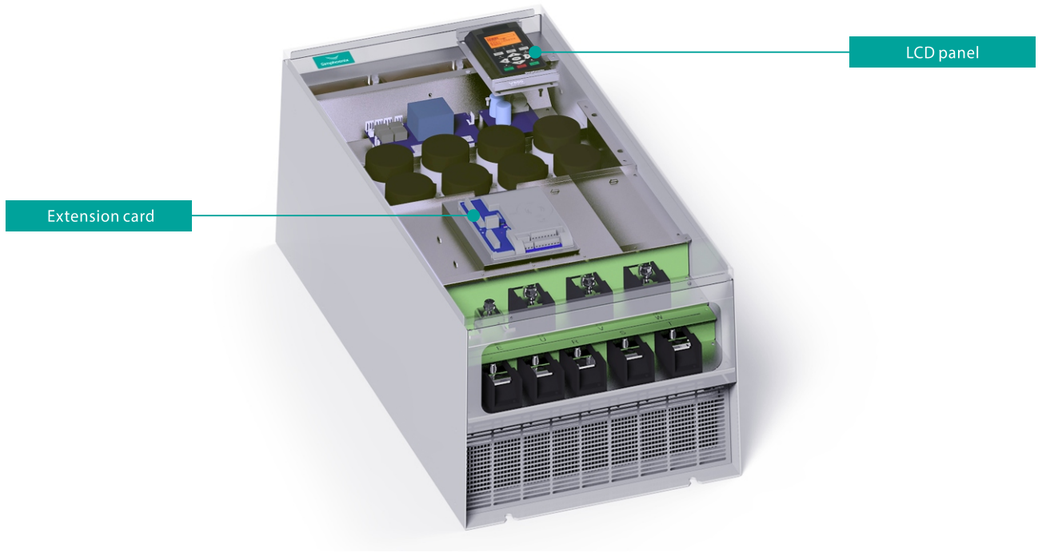
- Large torque output at low speed, 200% starting torque at zero speed
- Stable speed accuracy up to ±0.02%
- Torque response time less than 5ms.

More reliable hardware

Innovative design concept with leading R&D capabilities, greatly improve product reliability

Optimized core module, more stable and reliable

The new generation of switch supply, optimized layout and reduced product failure rate

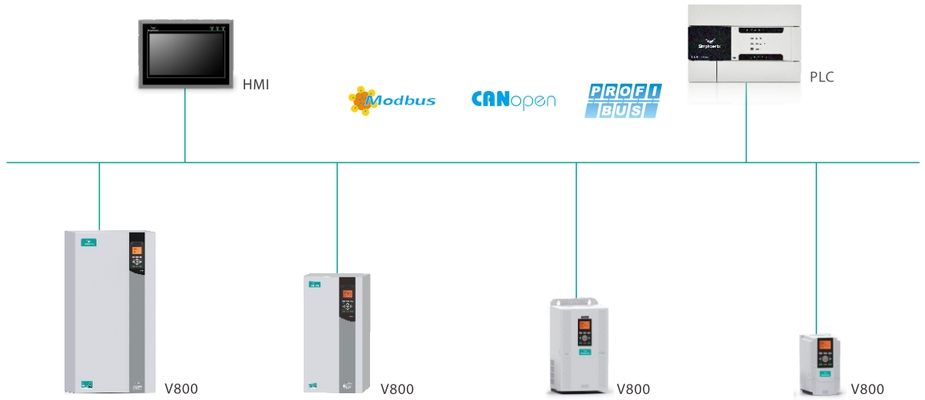


Open and flexible

Can extend multiple industrial buses, extend a wide range of industry-specific adapter cards and external interface cards

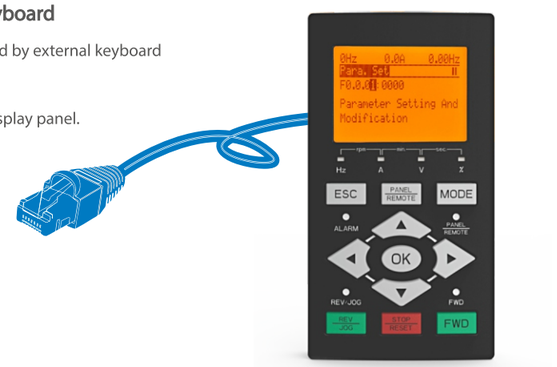
Open and flexible extensible platform

- Support Modbus-RTU protocol, profibus-DP protocol and CANopen bus protocol
- Hundreds of communication expansion cards, I/O expansion cards, industry function cards, PG cards can be selected for more complex industries and conditions.



Convenient and functional external keyboard

- Multi-machine joint debugging can be realized by external keyboard
- Parameter upload and download function
- Over 3.0kW models are equipped with LCD display panel.

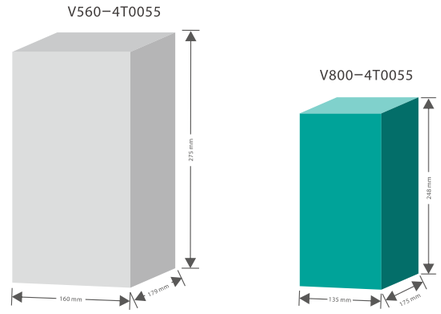


Optimized structural design

Compact structure and independent air duct can adapt to harsh environment

Compact size,save space

- Compact layout and miniaturization design
- Module installation layout is neat, improve the utilization of cabinet space
- Three-proofing lacquer enhance the ability to adapt harsh environments.



※For the same power, the volume of V800 series can be reduced by more than 30% compared to the V560 series

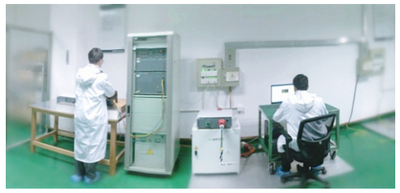
Reliable independent air duct

- Independent air duct ensure electrical isolation
- The electrical part is totally enclosed, which can enhance the ability to adapt harsh environment.

High quality assurance

The V800 series inverter has been subject to strick testing before release from the factory



EMC test

- Conducted immunity test
- Conducted disturbance test
- Voltage drop, short interruption test
- Voltage fluctuation test
- Power line lightning surge test
- Radiated immunity test
- Radiation disturbance test
- Harmonic test fast burst test
- Communication line lightning surge test
- Harmonic test

Environmental reliability experiment

- Single wing drop experiment
- Salt water spray experiment
- Constant temperature and humidity experiments
- High and low temperature gradient experiment
- Aging experiment
- Low temperature work experiment
- Cold and heat shock experiment
- Sine sweep experiment
- Random vibration experiment
- Classical impact test

Routine test

- Veneer test
- Lroutine inspection test
- Temperature rise test
- Short circuit test
- Acceleration and shock test
- Load shock test
- Motor speed accuracy
- Starting resistance shock test
- Overheat protection test
- Power factor test
- Efficiency measurement test
- Overload performance test
- Overvoltage or undervoltage protection test
- Current side voltage sampling accuracy and linearity test

… …

Technical Specification

Input and Output	Input voltage, frequency	3AC 380V ±20%； 50/60Hz		
	Output voltage	4T#series ： 0~380 V		
	Output frequency	Low Frequency mode：0.0~300.00Hz； High frequency mode：0.0~2000.0Hz		
	Digital input	V800-4T0030G/4T0040P and below units: Standard built-in 5 digital input(DI) V800-4T0040G/4T0055P and above units: Standard built-in 6 digital input(DI), can extend to16(extension sets optional)		
	Digital output	V800-4T0030G/4T0040P and below units: Standard built-in 1 digital output(DO) V800-4T0040G/4T0055P and above units: Standard built-in 2 digital output(DO)		
	Pulse input	0~100.0KHz pulse input，OC or 0~24V level signal are realizable（optional）		
	Pulse output	0~100.0KHz pulse output，PWM output mode to extend the analog output port(optional)		
	Analog input	Standard built-in: 0~10V voltage input(AI1); 0~20mA current input(AI2) Standard extended I/O card: -10~10V voltage input		
	Analog output	V800-4T0030G/4T0040P and below units: have one 0~10V analog output signal channel(0 ~ 20mA current output mode optional) V800-4T0040G/4T0055P and above units: have two 0~10V analog output signal channel (0 ~ 20mA current output mode optional)		
	Contact output	Standard one set AC 250V/2A normall open, normal closed contact, able to extend 1~6 sets normal open		
Control Characteristics	Contrul mode	Closed-loop Vector Control	Open-loop Vector Control	V/F Control
	Start Torque	0 Speed 200%	0 Speed 180%	0Speed 180%
	Speed Adjustment Range	1:1000	1:200	1:100
	Stable Speed Accuracy	±0.02%	±0.2%	±0.5%
	Torque Control Accuracy	±1%	±5%	--
	Torque Responding Time	≦5ms	≦25ms	--
	Frequency Resolution	Low Frequency running mode: 0.01Hz; High Frequency running mode： 0.1Hz		
	Frequency Accuracy	Low Frequency running mode: digital set-0.01Hz; analog set-highest frequency×0.1% High Frequency running mode: digital set-0.01Hz; analog set-highest frequency×0.1%		
	Overload Capability	G type: 110%--long term; 150%--60s; 180%--5s P type: 105%--long term; 120%--60s; 150%--1s		
	Carrier Wave Frequency	Three phase voltage vector combined mode: 1.5~12.0KHz；		
	Acc, And Dec. Time	0.01~600.00Sec. / 0.01~600.0Min.		
	Magnetic Flow Braking	By increasing motor magnetic flow(30~120% available), motor can achieve fast decreasing braking.		
	DC Braking/Band Brake	IInitial frequency of DC braking/band brake: 0.0~upper frequency, braking/band brake injecting current 0.0~100.0%		
	Start Frequency	0.0~50.00Hz		
Tipical Function	Multi-step running	16 frequency/speed running, each running direction, time, acc and dec set independently; 7 process PID set		
	Built-in PID	Built-in two PID controller(Process PID and compensation PID), able to be used by external equips and establish complex internal compensation control		
	Awakening Sleep	Process PID have simple sleep and awakening function		
	MODBUS communication	Standard MODBUS communication protocol(optional), flexible parameter read-write mapping function		
	Temperature test	It can receive PT100 or PTC thermosensitive element detection signal, realize overtemperature protection of motor or external equipment.		
	Dynamic Braking	(V800-4T0220G/4T0300P and below units) Acting voltage: 650~760V, braking rate: 50~100%		
	General Function	Reset after power stop, recovery with failure, motor parameter dynamic / static self-identification, start enable, running enable, start delay, over-current inhibit, over-voltage / low-voltage inhibit, V/F self-defined curve, analog input wave rectification, power-off test, textile machine disturbance(swing frequency) operation		

Function Feature	Virtual I/O port	It has 8 virtual output and input ports, and can easily realize complex field application without external wiring.
	Servo positioning function	Can realize simple servo control and spindle arbitrary angle positioning
	Communication Linkage Synchronization	It is easy to multi machine synchronous drive with free selection based on current, torque or power to reach multi machine linkage balance, and position synchronization balance function can ensure zero cumulative error of multi machine linkage.
	Overload Dynamic Balance	It can achieve multi-equips overload dynamic balance (not limit to communication linkage) to reach torque motor characteristics.
	Strong Start Torque	For the load with strong inertia, static friction, it can set super strong start torque for certain time.
	Setting Priority	User can select priority sequence for all kinds of frequency / rotate speed setting channels freely which is suitable for kinds of combined applications.
	Setting Combination	Hundreds of setting combination of frequency, rotate speed, torque etc.
	Compensation PID	Built-in compensation PID can flexibly realize varied applications including tension control, wire drawing machine control and so on.
	Dual motor parameters	Two sets of asynchronous motor parameters are stored in memory, so motor switching can be realized under vector control mode.
	Timer	Built-in 3 timers with 5 kinds of clock, 5 kinds of start modes, several controlSignals, multifarious working mode and 7 output signals
	Counter	2 inner counter：clock edge selection, 4 kinds of start modes, 7 output signals
	Macro Parameter	Application macro:Easy for setting and partial solidifying several usual parameter groups, simple parameter setting for general applications. System macro:The inverter is convenient to switch equipment's running mode (ex. Switching with high and low frequency running mode), and it can self-defined partial parameters anew.
	Parameter Debugging	Any unstored parameters on site debugging can be stored or abandoned and recovery at one key.
	Parameter Display	Shield non-use parameter modules automatically, or display revised, stock, changed parameters selectively.
Protection Function	Power supply	Undervoltage protection、lack of three-phase power phase protection
	Running Protection	Over-current protection, over-voltage protection, inverter over-heat protection, inverter overload protection, motor overload protection, output lack of phase protection, module driven protection
	Equip Abnormal	Current check abnormal, EEPROM storage abnormal, control unit abnormal, motor over-heat, MC suction failure, temperature collection loop failure
	Motor Connection	Motor non-connection, motor 3 phase parameter unbalance, parameter identification wrong
	Extension Card	Test if the extension card conflict
Environment Conditions	Installation Environment	Free from direct sunlight, no dust, no corrosive or flammable gases, no oil mist, no steam, no dripping or sal
	Altitude	under 1000m, 10% reduction in output current capability for every 1000 meters increase.
	Temperature	Work temperature: -10℃ ~ +40 ℃(+40℃ ~ +50 ℃please reduce the power)； Storage temperature: -20℃ ~ +60 ℃
	Humidity	Under 95%, no condensation
	Vibration	< 20m/s2

Model Descriptions

V800 - 4 T 0150 G

Product Series

V800	High-performance closed-loop vector inverter

Voltage Grade

2	220V
4	380V

Power Supply Phase

S	Single Phase
T	Three Phase

Load Type

P	Universal
G	Stable

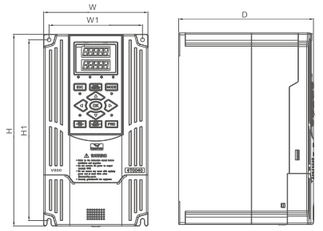
Power Grade KW

0011	1.1
0015	1.5
0022	2.2
0037	3.7
...	...
...	...
8000	800

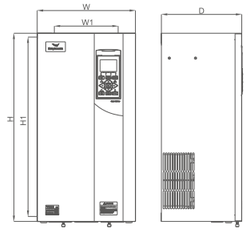
Model Table

Voltage class	Type	General load pattern			Steady load pattern		
		Rated capacity (KVA)	Rated current (A)	Suitable motor (kW)	Rated capacity (kVA)	Rated current (A)	Suitable motor (kW)
Three Phase 380V	V800-4T0011G/4T0015P	2.0	3.0	1.1	2.4	3.7	1.5
	V800-4T0015G/4T0022P	2.4	3.7	1.5	3.6	5.5	2.2
	V800-4T0022G/4T0030P	3.6	5.5	2.2	4.9	7.5	3.0
	V800-4T0030G/4T0040P	4.9	7.5	3.0	6.3	9.5	4.0
	V800-4T0040G/4T0055P	6.3	9.5	4.0	8.6	13.0	5.5
	V800-4T0055G/4T0075P	8.6	13.0	5.5	11.2	17.0	7.5
	V800-4T0075G/4T0090P	11.2	17.0	7.5	13.8	21	9.0
	V800-4T0090G/4T0110P	13.8	21	9.0	16.5	25	11
	V800-4T0110G/4T0150P	16.5	25	11	21.7	33	15
	V800-4T0150G/4T0185P	21.7	33	15	25.7	39	18.5
	V800-4T0185G/4T0220P	25.7	39	18.5	29.6	45	22
	V800-4T0220G/4T0300P	29.6	45	22	39.5	60	30
	V800-4T0300G/4T0370P	39.5	60	30	49.4	75	37
	V800-4T0370G/4T0450P	49.4	75	37	62.5	95	45
	V800-4T0450G/4T0550P	62.5	95	45	75.7	115	55
	V800-4T0550G/4T0750P	75.7	115	55	98.7	150	75
	V800-4T0750G/4T0900P	98.7	150	75	116	176	90
	V800-4T0900G/4T1100P	116	176	90	138	210	110
	V800-4T1100G/4T1320P	138	210	110	171	260	132
	V800-4T1320G/4T1600P	171	260	132	204	310	160
	V800-4T1600G/4T1850P	204	310	160	237	360	185
	V800-4T1850G/4T2000P	237	360	185	253	385	200
	V800-4T2000G/4T2200P	253	385	200	276	420	220
	V800-4T2200G/4T2500P	276	420	220	313	475	250
	V800-4T2500G/4T2800P	313	475	250	352	535	280
	V800-4T2800G/4T3150P	352	535	280	395	600	315
	V800-4T3150G/4T3500P	395	600	315	428	650	350
	V800-4T3500G/4T4000P	428	650	350	480	730	400
	V800-4T4000G/4T4500P	480	730	400	527	800	450
	V800-4T4500G/4T5000P	527	800	450	592	900	500
	V800-4T5000G/4T5600P	592	900	500	658	1000	560
	V800-4T5600G/4T6300P	658	1000	560	737	1120	630
	V800-4T6300G/4T7000P	737	1120	630	823	1225	700
	V800-4T7000G/4T8000P	823	1225	700	955	1450	800
	V800-4T8000G/4T9000P	955	1450	800	1053	1600	900

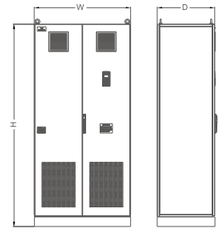
Installation and Dimension Figure



1 Class applicable models:
V800-4T0011G/4T0015P ~
V800-4T0300G/4T0370P



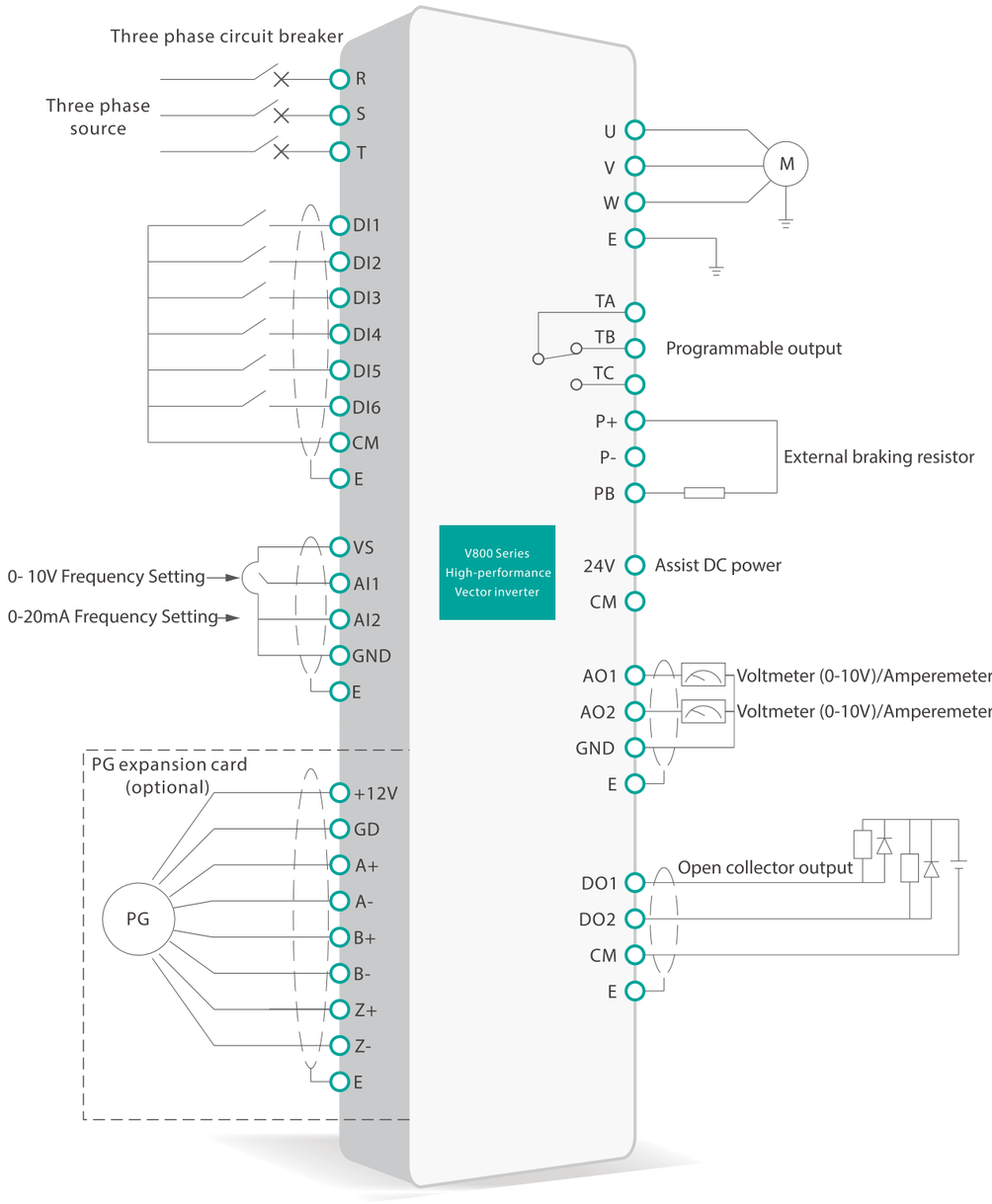
2 Class applicable models:
V800-4T0370G/4T0450P ~
V800-4T0550G/4T0750P



3 Class applicable models:
V800−4T3500G/4T4000P~
V800−4T8000G/4T9000P

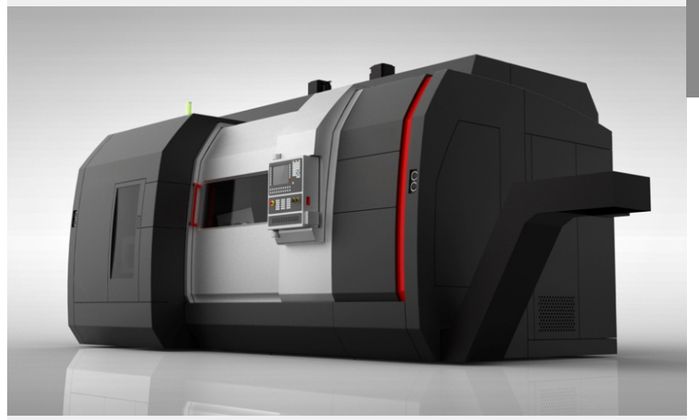
Inverter model (Three phase 380V)	W1 (mm)	W (mm)	H1 (mm)	H (mm)	D (mm)	Screw
V800−4T0011G/4T0015P	87	97	152	162	130	M4
V800−4T0015G/4T0022P						
V800−4T0022G/4T0030P	95	105	190	200	146	M4
V800−4T0030G/4T0040P						
V800−4T0040G/4T0055P	121	135	234	248	175	M4
V800−4T0055G/4T0075P						
V800−4T0075G/4T0090P	146	160	261	275	179	M5
V800−4T0090G/4T0110P	169	180	290	305	179	M5
V800−4TO110G/4T0150P						
V800−4TO15OG/4T0185P	160	210	387	405	202	M6
V800−4T0185G/4T0220P						
V800−4TO220G/4T0300P	160	250	422	445	216	M8
V800−4T0300G/4T0370P						
V800−4T0370G/4T0450P	160	260	483	500	250	M8
V800−4T0450G/4T0550P	200	300	558	567	250	M8
V800−4T0550G/4T0750P						
V800−4T0750G/4T0900P	240	340	702	717	280	M10
V800−4T0900G/4T1100P						
V800−4T1100G/4T1320P	300	400	700	717	280	M10
V800−4T1320G/4T1600P						
V800−4T1600G/4T1850P	300	450	860	890	350	M10
V800−4T1850G/4T2000P	450	580	925	950	380	M12
V800−4T2000G/4T2200P						
V800−4T2200G/4T2500P						
V800−4T2500G/4T2800P	500	640	1240	1265	400	M12
V800−4T2800G/4T3150P						
V800−4T3150G/4T3500P						
V800−4T3500G/4T4000P	—	900	—	2100	600	—
V800−4T4000G/4T4500P						
V800−4T4500G/4T5000P	—	1000	—	2100	600	—
V800−4T5000G/4T5600P						
V800−4T5600G/4T6300P	—	1200	—	2100	600	—
V800−4T6300G/4T7000P						
V800−4T7000G/4T8000P						
V800−4T8000G/4T9000P						

Wiring Diagram



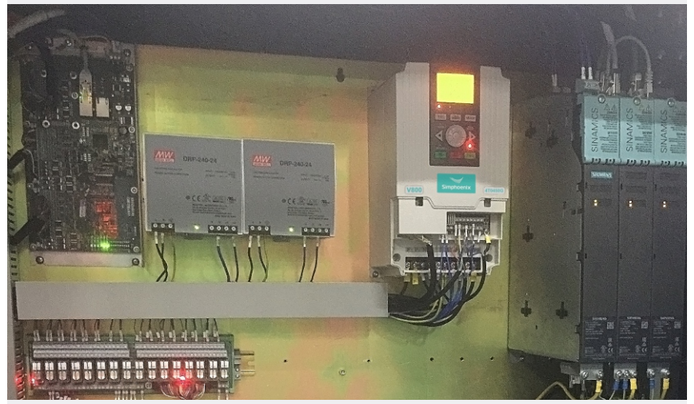
Application of V800 series inverter in machining center

With the continuous upgrading of the industry, more and more CNC machine tool users require machine tool spindles with ultra-high-speed machining capability, higher processing efficiency and precision. Therefore, high-speed electric spindles with high speed, high precision and high efficiency are gradually replacing the traditional machine tool spindle system. CNC machine tools are rapidly developing towards energy-saving, high precision, high processing efficiency and intelligence.



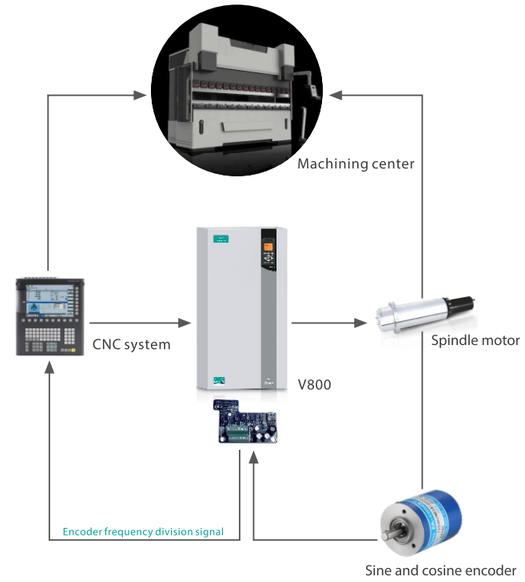
System solution

The V800 series inverters have built-in leading electric spindle control algorithms, which can be easily handled by both synchronous spindle motors and asynchronous spindle motors. It can output up to 2000Hz and achieve a high speed of up to 60,000 rpm. With the special expansion card for the electric spindle, the sine and cosine encoder for the spindle motor is supported. Through the high-precision analysis of the sine wave, the resolution can be greatly improved. It is equipped with a single pulse frequency division signal output, which is provided to the numerical control system to realize double closed loop control. The inverters are full of many practical functions, including integrated stop positioning, servo fixed angle, servo fixed length, rigid tapping, which can meet the process requirements of various high-speed electric spindles with its functional control terminals. Therefore,it is a excellent product that suitable spindle driving of upmarket machine tools.



Process requirements

- Fast acceleration and deceleration
- Strong cutting ability when low frequency
- Small fluctuation at high speed
- With spindle quasi-stop, positioning, rigid tapping and other functions
- Support sine and cosine encoder



Solution advantage

- Leading spindle motor control algorithm, large torque at low frequency, high precision at high speed
- The highest quadrature pulse input is 200kHz, which can be matched with mainstream CNC system
- Suitable for synchronous and asynchronous servo spindle motors
- Support sine and cosine encoder, can separate the crossover signal to the CNC system
- Below 22kW, there are built in brake units, which can achieve rapid deceleration
- It can realize the functions of spindle quasi-stop, arbitrary angle tool change, rigid tapping, etc.