Simphoenix

DX500 Series

High Performance Closed Loop Vector Inverter

Shenzhen Simphoenix Electric Technology Co., Ltd

 Address: Building A, Huichao Industrial Park, 2nd Rd of Gushu, Xixiang,
Baoan District, Shenzhen, Guangdong, China
Tel: 86-755-26607756, 26910801
Fax: 86-755-26912599, 26919882
E-mail: business01@sunfardrive.com / business02@sunfardrive.com
Web: www.simphoenix.com

Huizhou Simphoenix Electric Co., Ltd

Address: No. 23 Songbailing Avenue, Startup Area, China-Korea Huizhou Industrial Park,
Zhongkai High-Tech Zone, Huizhou, Guangdong Province, China
Tel: 86-755-2600100

V1.2-2026.03

CE SGS

Enterprise vision
to be outstanding automation product and solution provider

Enterprise Spirit
Innovation and enterprising

Enterprise Mission
to creat value for customers

Business Philosophy
People oriented and common progress

Core Value
Integrity, win-win, pragmatic, dedication

5 Regions

18 Overseas sales network

35 Offices

Established in 2004, Shenzhen Simphoenix Electric Technology Co., Ltd. is committed to becoming an outstanding provider of automation products and solutions. The company specializes in the development, production, sales and service of industrial automation products, the main products are servo drive, inverter, permanent magnet synchronous motor, PLC, HMI and so on. In addition, Huizhou Co., Ltd., a wholly-owned subsidiary of Electric, focuses on the field of automation and works together with its parent company to provide customers with first-class products and solutions.

After more than twenty years of development, Simphoenix has become a well-known brand with complete product structure and strong r&d strength among domestic industrial automation brands.
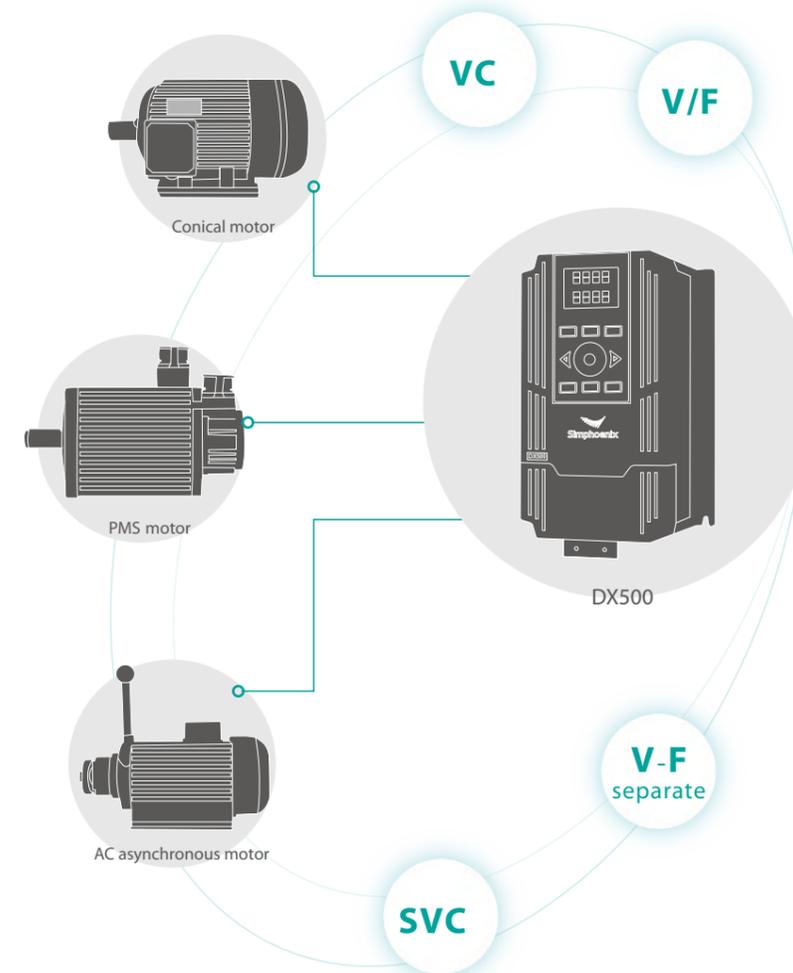
DX500 Series

High Performance Closed Loop Vector Inverter

DX500 is a high-performance vector converter designed based on the new generation control platform of Simphoenix. It adopts software and hardware modular design, standard LCD display keyboard, and richer control algorithms. This series of machines has flexible expansion capability, and can easily cope with various complex and diverse sites to meet the personalized needs of customers.

Wider application range

It is widely used in machine tools, cable machinery, petrochemical industry, textile industry, food packaging, washing equipment, centrifuge, etc.

| machining center | cable machinery | petrochemical industry | textile industry | food packaging | Lifting lifting |

Richer control algorithms

- Inherit the excellent performance and stable quality of the previous generation of products to meet the needs of users in more industries.
- Integrate the control algorithm of asynchronous motor and permanent magnet synchronous motor.
- Integrates speed, torque and simple servo control.
- Servo positioning function, which can realize simple servo functions such as spindle arbitrary angle positioning, pulse control, stop and fixed angle.

VC   V/F

Conical motor

PMS motor

DX500

V-F separate

AC asynchronous motor

SVC

Fast torque response and higher speed stability accuracy

- The torque response time is less than 5ms, the zero-speed torque can reach 200%, and the torque control accuracy can reach 1%.
- With 8-channel one-to-one virtual output and input ports, it can easily realize complex engineering field applications without external wiring.
- It is easy to realize synchronous transmission of multiple machines and can freely choose to realize linkage balance of multiple machines according to current, torque and power.
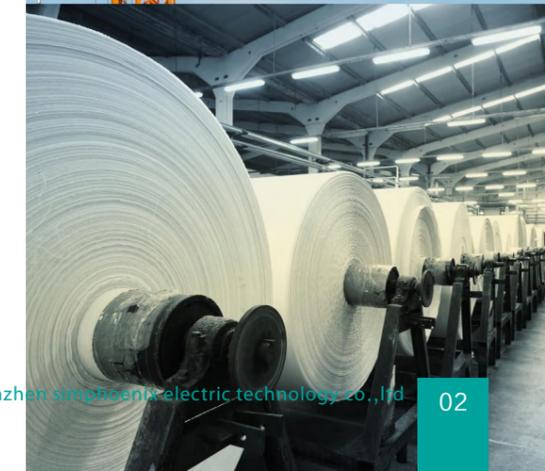
Higher hardware reliability

- Innovative design concept combined with leading development ability can greatly improve the reliability of products.

- The core modular optimization design is more stable and reliable.

- DC fan is used for heat dissipation, with good heat dissipation effect, stable performance and easy disassembly and cleaning.

- Up to hundreds of communication expansion cards, I/O expansion cards, industry function cards and PG cards are optional, applicable to more and more complex industries and industries.

Modular assembly mode, more compact structure and smaller volume

Keyboard extension cable can be pulled out; When the extension cable is pulled out for installation, the keyboard can be equipped with multiple options.

Removable DC fan, easy to clean

It can expand a variety of expansion cards to meet user needs

Industry-specific adapter card   I/O Extension Card   Communication Adaptive Card   PG Extension Card

Tension control card APV-F301

Food machinery expansion card APV-A310

IOV-D200 IOV-D201

IOV-A102

IOV-A103

CANopen communication adaptive card IOV-D109

Profibus-DP communication adaptive card IOV-E108

PN communication adaptive card IOV–D202

Sine cosine PG card PGV-C006

PG signal separation card PGV-C001

Powerful industrial bus expansion capability

- A powerful, open and flexible extensible platform that can expand a variety of industrial buses.

- Support Modbus-RTU, Profibus-DP and CANopen bus protocols, improve equipment technology and enhance customer application flexibility.

- RS485 communication port is equipped as standard to communicate with multiple frequency converters.

HMI

PLC

Modbus   PROFI NET®   CANopen   PROFI BUS

DX500   DX500   DX500   DX500
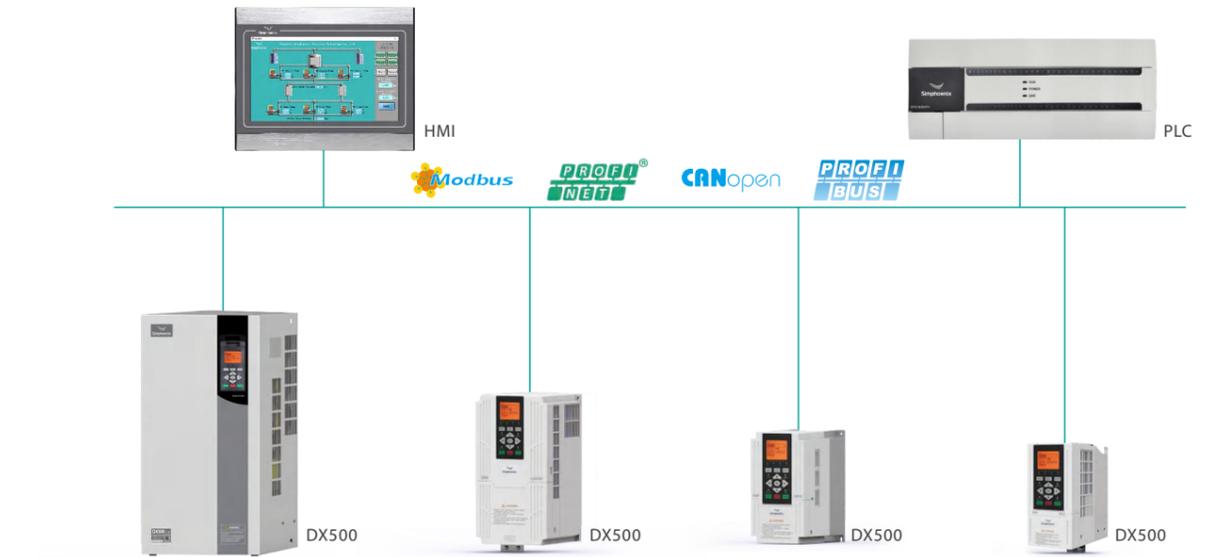
Fine design

- Miniaturized design reduces the volume by 25%.

- 45 kW and above standard DC reactor, with higher power factor.

- More compact cabinet application, 450kW and above built-in input AC reactor.

- All series of standard LCD display panel.

- 22kW and below built-in brake unit.

DC reactor   AC reactor   LCD display panel
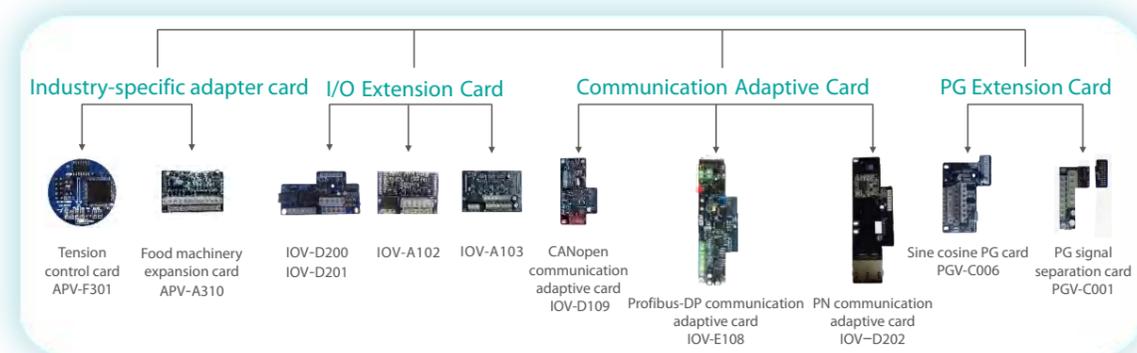
Higher product testing standards

* DX500 series products are delivered after rigorous EMC test, environmental reliability test, routine inspection and other standard tests.

| EMC
Experiment | Environmental
Reliability Test | Routine
Inspection |

- ● Conducted immunity (CS) test
- ● Conducted harassment (CE) test
- ● Voltage Dips and short Interruptions
- ● Voltage fluctuation test
- ● Power cable lightning surge test
- ● Radiation immunity (RS) test
- ● Radiation emission (RE) test
- ● Harmonic test
- ● Fast bursts test
- ● Communication cable lightning surge test
- ● Harmonic test

- ● Single Wing Drop Test
- ● Salt Spray Test
- ● Constant temperature and humidity and high and low temperature gradient test
- ● Aging Test
- ● Low Temperature Work Test
- ● Thermal Shock Test
- ● Sine Sweep Test
- ● Random Vibration Test
- ● Classic Impact Test

- ● Routine inspection test
- ● PCB test
- ● Temperature rise test
- ● Short- circuit test
- ● Acceleration and deceleration impact test
- ● Motor rotation accuracy test
- ● Startup resistor impact test
- ● Load-impact test
- ● Over-heat protection test
- ● Power factor test
- ● Overload performance test
- ● Efficiency test
- ● Over-voltage or under-voltage protection test
- ● Current side voltage sampling accuracy and linerlity
- ……

Technical parameter

|				
Input and output	Rated voltage and frequency	Single-phase (2S # series) 220V (± 10%) 50/60Hz (± 5%) Three-phase (4T # series) 380V~415V (± 10%) 50/60Hz (± 5%)		
	Output voltage	0~input voltage		
	Output frequency	Low frequency operation mode: 0.0~300.00Hz; High frequency operation mode: 0.0~2000.0Hz		
	Digital input	● Standard configuration 5-channel digital input (DI) ● DX500-4T0055G/4T0075P and above models: can be extended to 16-channel (optional expansion component)		
	Digital output	standard configuration 2 digital outputs (DO)		
	Pulse input	0~100.0KHz pulse input, can accept OC or 0~24V level signal (optional)		
	Pulse output	0~100.0KHz pulse output (optional), PWM output mode can be selected to expand analog output port		
	Analog input	Standard configuration: 0~10V voltage input (AI1); 0~20mA current input (AI2) Standard expansion I/O card: - 10V~10V voltage input		
	Analog output	1 channel of 0~10V analog output signal (0~20mA current output mode can be selected)		
	Contact output	Standard set of AC 250V/2A normally open and normally closed contacts, expandable 1~6 sets of normally open and normally closed contacts		
Control characteristics	Control mode	Closed-loop vector control	Open-loop vector control	V/F control
	Starting torque	0 speed 200%	0 speed 180%	0 speed 180%
	Speed range	1：1000	1：200	1：100
	Steady speed accuracy	±0.02%	±0.2%	±0.5%
	Torque control accuracy	±1%	±5%	—
	Torque response time	≦5ms	≦25ms	—
	Frequency resolution	Low frequency operation mode: 0.01Hz; High frequency operation mode: 0.1Hz		
	Frequency accuracy	● Low frequency operation mode: digital setting -- 0.01Hz, analog setting -- maximum frequency × 0.1% ● High frequency operation mode: digital setting -- 0.1Hz, analog setting -- maximum frequency × 0.1%		
	Load capacity	● General load mode: 110% - long-term; 150% - 60 seconds; 180% - 5 seconds ● Steady load mode (capacity increase mode): 105% - long-term; 120% - 60 seconds; 150% - 1 second		
	Carrier frequency	● Two-phase voltage vector synthesis mode: 1.5~12.5KHz; ● Three-phase voltage vector synthesis mode: 1.5~12.0KHz; (High frequency mode can reach 15KHz)		
	Acceleration and deceleration time	0.01~600.00Sec. / 0.01~600.0Min.		
	Magnetic flux brake	By increasing the magnetic flux of the motor (30~120% can be set), realize the fast deceleration braking of the motor		
	brake/holding brake	DC braking/holding brake initial frequency: 0.0~upper limit frequency, braking/holding brake injection current 0.0~100.0%		
	Start frequency	0.0~50.0Hz		
Typical functions	Multi-segment operation	16-segment frequency/speed operation, and the operation direction, time, acceleration and deceleration of each segment are set independently; 7-stage process PID setting		
	Built-in PID	Two built-in PID controllers (process PID and compensation PID) can be independently used by external equipment, and complex internal compensation control can also be formed		
	Wake up sleep	Process PID has concise sleep and wake-up functions		
	MODBUS communication	Standard MODBUS communication protocol (optional), flexible parameter reading and writing mapping function		
	Temperature detection	It can receive PT100 or PTC temperature sensor detection signal to realize over-temperature protection of motor or external equipment		
	Energy consumption braking	(DX500-4T0220G/4T0300P and below models are standard)Action voltage: 650~760V, braking rate: 50~100%		
	General functions	Power failure restart, fault self-recovery, dynamic/static self-identification of motor parameters, allowable startup enable, allowable operation enable, startup delay, overcurrent suppression, overvoltage/undervoltage suppression, V/F user-defined curve, analog input curve correction, wire break detection, textile machinery disturbance (swing) operation		

|		
Features	Virtual I/O ports	With 8-channel one-to-one virtual output and input ports, complex engineering field applications can be easily realized without external wiring
	Position servo and Indexing positioning	Realize simple servo control and accurate positioning of spindle angle
	Communication linkage synchronization	It is easy to realize the synchronous transmission of multiple machines, and can freely choose to realize the linkage balance of multiple machines according to the current, torque and power. The position synchronous balance function can ensure the zero cumulative error of the linkage of multiple machines
	Dynamic load balancing	It can also realize the dynamic balance of multi-machine loads (not limited to communication linkage) and realize the characteristics of torque motor
	Strong starting torque	For loads with large inertia and large static friction, a certain time of super-strong starting torque can be set
	Setting Priorities	Users can freely choose the priority order of various frequency/speed setting channels, which is suitable for combined applications in various occasions
	Set combination	Up to hundreds of frequency, speed, torque and other multiple setting combinations
	Compensation PID	The specially built-in compensation PID can flexibly realize various special applications including tension control, wire drawing machine control, etc
	Dual motor parameters	Two sets of asynchronous motor parameters are stored, and motor switching can also be realized under vector control mode
	Timer	3 built-in timers: 5 kinds of clocks, 5 kinds of start trigger modes, various gate control signals and working modes, and 7 kinds of output signals
	Counter	2 built-in counters: clock edge selection, 4 kinds of start trigger methods, 7 kinds of output signals
	Macro parameters	Application macro: it is convenient to set and partially solidify a variety of common group parameters to simplify parameter setting in general applications System macro: it is convenient to switch the working mode of equipment (such as high and low frequency operation mode switch), and automatically redefine local parameters
Protection function	Parameter debugging	Any parameter that is not stored during field commissioning can be stored or abandoned and restored with one key
	Parameter display	Automatically mask parameters of unused function modules, or selectively display modified, stored and changed parameters
	Power Supply	Undervoltage protection, three-phase power unbalance protection
	Operation protection	Overcurrent protection, overvoltage protection, converter overheat protection, converter overload protection, motor overload protection, output phase loss protection, module drive protection
	Equipment abnormality	Current detection is abnormal, EEPROM memory is abnormal, control unit is abnormal, motor overheat, MC pull-in fault, temperature acquisition circuit fault
	Motor connection	The motor is not connected, the three-phase parameters of the motor are unbalanced, and the parameter identification error
	Expansion card	Detect and protect whether the expansion card is compatible or conflicting
Environment	Installation environment	Indoor vertical installation, free from direct sunlight, dust, corrosive, flammable gas, oil mist, water vapor, dripping water or salt
	Altitude	0-1000 meters. The output current capacity will be derated by 10% for every 1000m increase
	Ambient temperature	Working environment temperature: -10℃~+50℃; Storage environment temperature: -20℃~+60℃
	Humidity	Less than 95%, no water condensation
	Vibration	≤6m/s^2
	Protection level	IP20

Naming Rule

DX500－4 T 0015 G

Model
DX500 series High Performance Closed Loop Vector Inverter

Voltage classes	
4	AC－380V
2	AC－220V

Power phase	
T	three phase
S	single phase

Load type	
G	Overloading
P	Underloading

Adpater motor（kW）	
0007	0.7
0015	1.5
0022	2.2
…	…
4000	400

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)
single phase 220V (±10%)	DX500-2S0007Q	1.9	5.0	0.75	–	–	–
	DX500-2S0011Q	2.5	6.5	1.1	–	–	–
	DX500-2S0015Q	2.9	7.5	1.5	–	–	–
	DX500-2S0022Q	3.8	10.0	2.2	–	–	–
three phase 380V~ 415V(±10%)	DX500-4T0011G/4T0015PQ	2.0	3.0	1.1	2.4	3.7	1.5
	DX500-4T0015G/4T0022PQ	2.4	3.7	1.5	3.6	5.5	2.2
	DX500-4T0022G/4T0030PQ	3.6	5.5	2.2	4.9	7.5	3.0
	DX500-4T0030G/4T0040PQ	4.9	7.5	3.0	6.3	9.5	4.0
	DX500-4T0040G/4T0055PQ	6.3	9.5	4.0	8.6	13.0	5.5
	DX500-4T0055G/4T0075PQ	8.6	13.0	5.5	11.2	17.0	7.5
	DX500-4T0075G/4T0090PQ	11.2	17.0	7.5	13.8	21	9.0
	DX500-4T0090G/4T0110PQ	13.8	21	9.0	16.5	25	11
	DX500-4T0110G/4T0150PQ	16.5	25	11	21.7	33	15
	DX500-4T0150G/4T0185PQ	21.7	33	15	25.7	39	18.5
	DX500-4T0185G/4T0220PQ	25.7	39	18.5	29.6	45	22
	DX500-4T0220G/4T0300PQ	29.6	45	22	39.5	60	30
	DX500-4T0300G/4T0370PQ	39.5	60	30	49.4	75	37
	DX500-4T0370G/4T0450PQ	49.4	75	37	62.5	95	45
	DX500-4T0450G/4T0550PQ	62.5	95	45	75.7	115	55
	DX500-4T0550G/4T0750PQ	75.7	115	55	98.7	150	75
	DX500-4T0750G/4T0900PQ	98.7	150	75	116	176	90
	DX500-4T0900G/4T1100PQ	116	176	90	138	210	110
	DX500-4T1100G/4T1320PQ	138	210	110	171	260	132
	DX500-4T1320G/4T1600PQ	171	260	132	204	310	160
	DX500-4T1600G/4T1850PQ	204	310	160	237	360	185
	DX500-4T1850G/4T2000PQ	237	360	185	253	385	200
	DX500-4T2000G/4T2200PQ	253	385	200	276	420	220
	DX500-4T2200G/4T2500PQ	276	420	220	313	475	250
	DX500-4T2500G/4T2800PQ	313	475	250	352	535	280
	DX500-4T2800G/4T3150PQ	352	535	280	395	600	315
	DX500-4T3150G/4T3500PQ	395	600	315	424	645	350
	DX500-4T3500G/4T4000PQ	428	650	350	480	730	400
	DX500-4T4000G/4T4500PQ	480	730	400	527	800	450
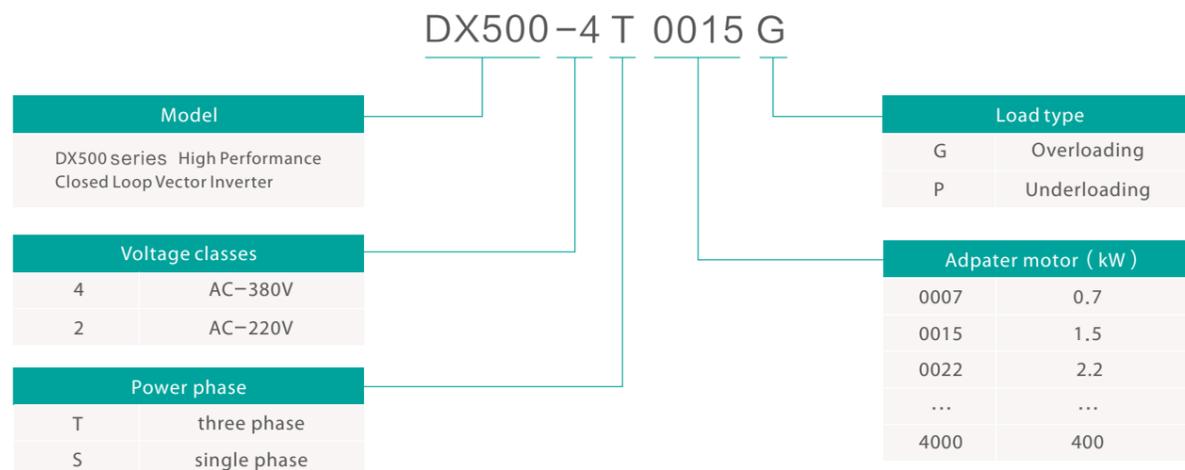
Mounting dimension
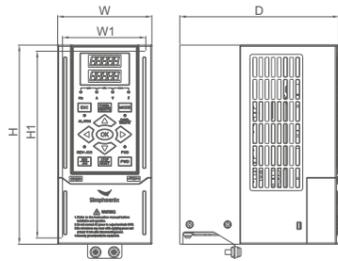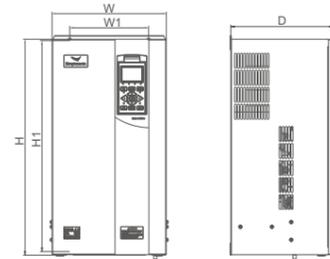

Class Ⅰ applicable model：
DX500-4T0011G/4T0015PQ
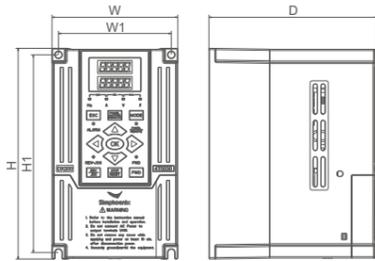
Class Ⅱ applicable model
DX500-2S0007Q~DX500-2S0022Q
DX500-4T0015G/4T0022PQ~DX500-4T0040G/4T0055PQ
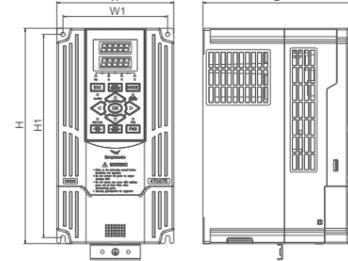
Class Ⅱ applicable model
DX500-4T0055G/4T0075PQ~DX500-4T0370G/4T0450PQ
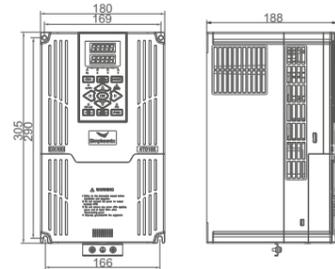
Note ：two special models ：
DX500-4T0150G/4T0185PQ~DX500-4T0185G/4T0220PQ

Class Ⅳ applicable model
DX500-4T0450G/4T0550PQ~DX500-4T40000G/4T4500PQ

model		W1 (mm)	W (mm)	H1 (mm)	H (mm)	D (mm)	screw specification
DX500-4T0011G/4T0015PQ		67	77	152	162	130	M4
DX500-2S0007Q	DX500-4T0015G/4T0022PQ	87	97	152	162	130	M4
DX500-2S0011Q	DX500-4T0022G/4T0030PQ						
DX500-2S0015Q	DX500-4T0030G/4T0040PQ	95	105	190	200	146	M4
DX500-2S0022Q	DX500-4T0040G/4T0055PQ						
DX500-4T0055G/4T0075PQ		121	135	234	248	175	M4
DX500-4T0075G/4T0090PQ							
DX500-4T0090G/4T0110PQ		146	160	261	275	179	M5
DX500-4T0110G/4T0150PQ							
DX500-4T0150G/4T0185PQ		169 166	180	290	305	188	M5
DX500-4T0185G/4T0220PQ							
DX500-4T0220G/4T0300PQ		160	210	387	405	211	M6
DX500-4T0300G/4T0370PQ		160	250	428	445	216	M6
DX500-4T0370G/4T0450PQ							
DX500-4T0450G/4T0550PQ		200	290	525	545	260	M8
DX500-4T0550G/4T0750PQ							
DX500-4T0750G/4T0900PQ		230	330	603	625	280	M10
DX500-4T0900G/4T1100PQ							
DX500-4T1100G/4T1320PQ		280	380	760	785	300	M10
DX500-4T1320G/4T1600PQ							
DX500-4T1600G/4T1850PQ		320	450	919	945	300	M10
DX500-4T1850G/4T2000PQ							
DX500-4T2000G/4T2200PQ							
DX500-4T2200G/4T2500PQ		350	480	1022	1050	300	M12
DX500-4T2500G/4T2800PQ							
DX500-4T2800G/4T3150PQ		480	550	1116	1145	300	M12
DX500-4T3150G/4T3500PQ							
DX500-4T3500G/4T4000PQ		500	670	1173	1200	350	M12
DX500-4T4000G/4T4500PQ							

Wiring Diagram
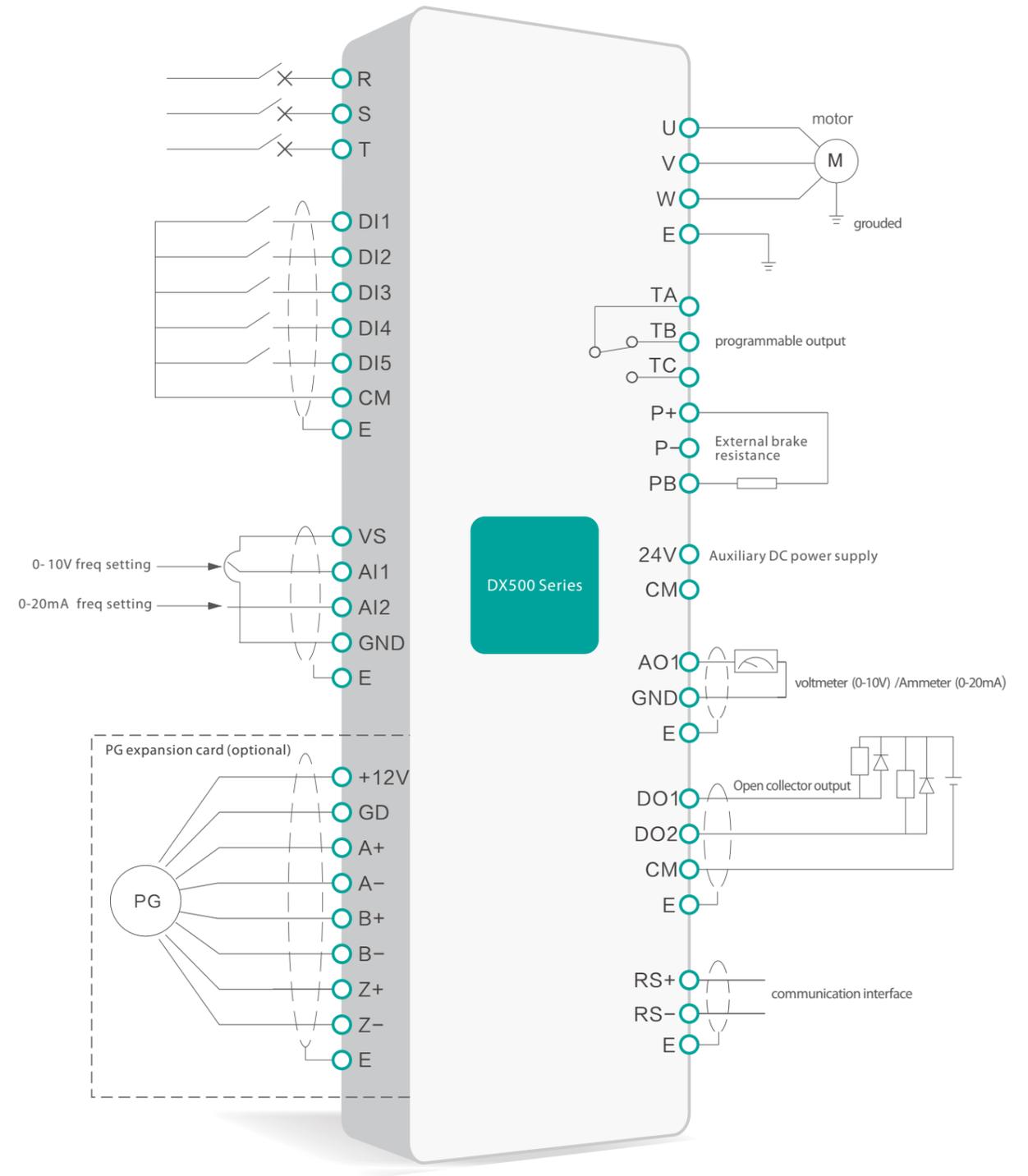
Application of DX500 series converter

in CNC machining center

With the development of electronic information technology, the machine tool industry has entered the era of electromechanical integration with digital manufacturing technology as the core, and CNC machining center is one of the representative products. CNC machining centers are widely used in 3C industry parts processing, new energy automobile parts processing, precision mold processing, medical industry parts processing, and other precision parts processing. Simphoenix DX500 series high-performance closed-loop vector converter integrates the leading motor control algorithm with optional PG expansion card to easily meet the driving requirements of various electric spindles in the machining center. Automatic tool replacement is one of the core functions of the CNC machining center, which requires the spindle to be able to perform certain precision stop positioning and multi-angle positioning. The standard servo control and indexing positioning functions of DX500 series converters can control the electric spindle to achieve high-precision positioning functions.

Spindle positioning system scheme

DX500 series high-performance closed-loop vector converter is used to drive the high-speed electric spindle, and PG signal separation card (PGV-C001) is used to receive the encoder signal of the high-speed spindle. At the same time, a group of differential PG signals can be separated and fed back to the numerical control system to realize the double closed-loop control of the converter and the numerical control system. DX500 series integrates simple servo positioning function. Through the combination of DI digital terminals, it can control the spindle positioning to the tool change angle, and can realize the positioning tool change of up to 8 angles. The simple servo function can also realize the functions of stopping the machine to specify the angle, spindle positioning servo travel, etc. It can select a variety of setting methods, such as digital setting, analog setting, MODBUS setting value, pulse setting, etc., with flexible expansion ability, and can easily cope with various complex and diverse scenes, to meet the personalized needs of customers.

Program features

■ Leading spindle motor control algorithm, applicable to various asynchronous and synchronous spindle motors;
■ The maximum output frequency is 2000Hz, which can easily cope with various high-speed motorized spindles;
■ Built-in servo control function to realize the spindle quasi-stop, tool change at any angle and other functions;
■ 22kW and below models are equipped with built-in braking unit and braking resistor to realize rapid shutdown;
■ The torque response time is less than 5ms, the zero-speed torque can reach 200%, and the torque control accuracy can reach 1%;
■ With compact structure and refined design, the volume of the V800 series is reduced by 25% compared with the power model;

CNC system

Encoder feedback

DX500

High-speed spindle