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SERVO DRIVE | AC DRIVE | PMSM | PLC | HMI

Simphoenix

DX100 Series

Vector Control Universal Inverter

TO BE OUTSTANDING AUTOMATION PRODUCT AND SOULUTION PROVIDER

We are devoted to be remarkable automation product and solution provider

Enterprise Mission

to creat value for customers

Enterprise Vision

to be outstanding automation product and solution provider

Enterprise Spirit

Innovation and enterprising

Core Value

Integrity, win-win, pragmatic, dedication

Business Philosophy

People oriented and common progress

- ★ Headquarter
- Oversea sales network
- Domestic sales network

5 Regions

15 Overseas sales network

35 Offices

Timely response to the customer requirements

www.simphoenix.com

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.

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

Introduction

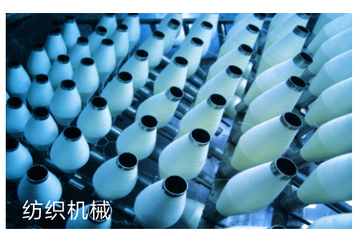
DX100

Series Vector Control Universal Inverter

Dx100 series is a universal open-loop vector inverter developed based on a new software and hardware platform. It has the characteristics of high performance, compact size, rich functions, convenient debugging, complete protection, and wide coverage of the power range of the model. It can be widely used in machine tool spindles, wood carving, glass edging, textile machinery, cable machinery and other automation equipment.

Typical Applications

Machine tool, Cable Petrochemical, Textile, Food packaging, Elution equipment, Centrifuges



Product Features

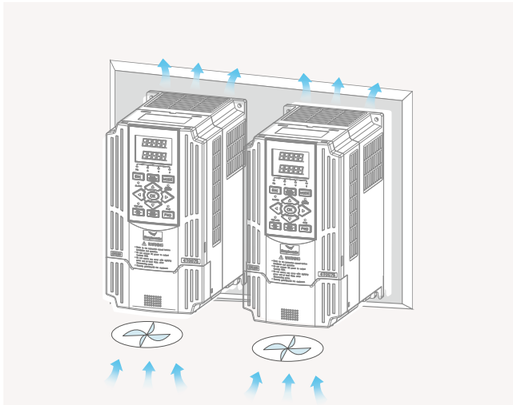
Innovations

- Small and compact design, improves space utilization.
- Modular design with higher stability
- With secondary development interface, can be customized functions.

※ Under the same power model, the volume of DX100 is reduced by 20%-57% compared with E580.

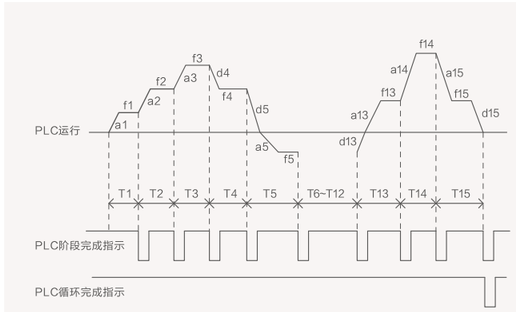
Structure

- The body is compact and easy to assemble.
- Independent air duct and lower air blowing scheme design, improve internal heat dissipation effect.
- Closed shell, exquisite three-proof paint technology, dust proof and moisture-proof, high stability.



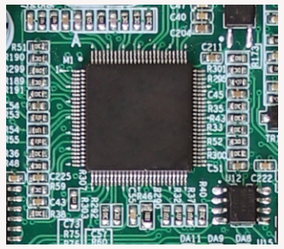
Software

- Equipped with linkage synchronization control function.
- Integrate multiple control algorithms such as V/F and current open loop vector and SVC.
- Various frequency setting channels and start-stop methods.
- Complete fault detection and protection functions.
- Simple programmable multi-stage operation.



Performance

- Passed stringent international EMC standard tests
- High-performance MCU with fast response speed, high speed stabilization accuracy, and high frequency resolution.
- Support multiple field buses, standard RS485 communication interface supports Modbus RTU communication.

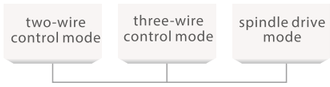


More powerful software functions

The DX100 series inverter has greatly upgraded and improved the software, and its maximum operating frequency can reach 1000Hz, which can easily meet the needs of cutting, engraving and milling industries. Increase application macro parameters, virtual DI, DO terminals, mapping access parameters, built-in PID function, frequency setting channel, analog input disconnection detection, strong starting current and other functions.

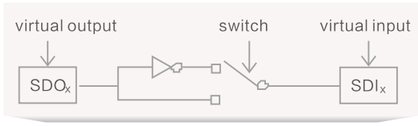
◆Application macro parameter

It can easily set and solidify the multiple common industry parameters. Common modes such as two-wire control mode, three-wire control mode, spindle drive mode and so on.



◆Virtual I/O interface

The 16-channel virtual I/O interface simplifies external wiring in complex situations, avoids the possibility of interference of control lines, and also extends external terminals to a certain extent



◆Mapping access parameter

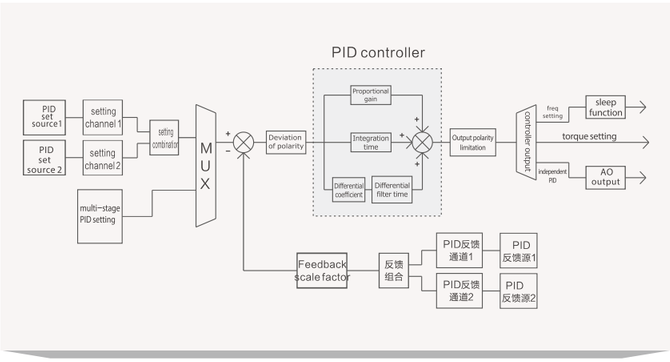
By setting the mapping function parameters, multiple parameters can be read continuously in one frame of instruction. When the customer uses the host computer to communicate with the inverter, they can obtain multiple non-continuous parameters more quickly and conveniently.

Multiple function parameters of non-contiguous addresses

Parameters stored in consecutive address units

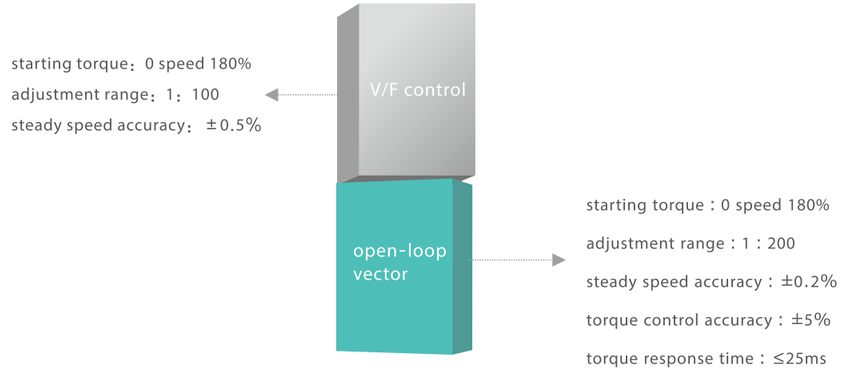
◆Built-in PID function

Built-in PID regulator, with the frequency given channel Option, the user can easily realize the automatic process control, such as constant temperature, constant pressure, tension, etc.



More outstanding control performance

The DX100 inverter series has more control algorithms, which have greatly improved the starting torque, speed regulation range, speed stabilization accuracy, torque control accuracy, torque response time and other important indicators.



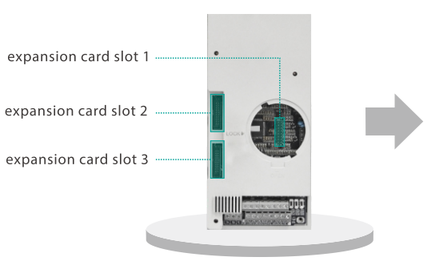
Stricter product testing standards

The following table shows the test results of several major items in the safety regulations and EMC of DX100 series products:

Item		test result	standard
Insulation resistance		＞1MΩ	GB12668
Compressive strength		2.5KVAC，60s Leakage current ≤1mA	GB12668
ESD	contact discharge	±4KV	EN61000−4−2
	air discharge	±8KV	
	Coupling discharge	±8KV	
EFT	RST	±4KV	EN61000−4−4
	UVW	±2KV	
	signal line	±2KV	
power line surge	interphase	±2KV	EN61000−4−5
	relatively	±4KV	
Conducted immunity test freq. range 150KHz~80MHz）		10V（e.m.f）	EN61000−4−6

Product upgrades and change

◆More abundant I/O interface for Industry 4.0

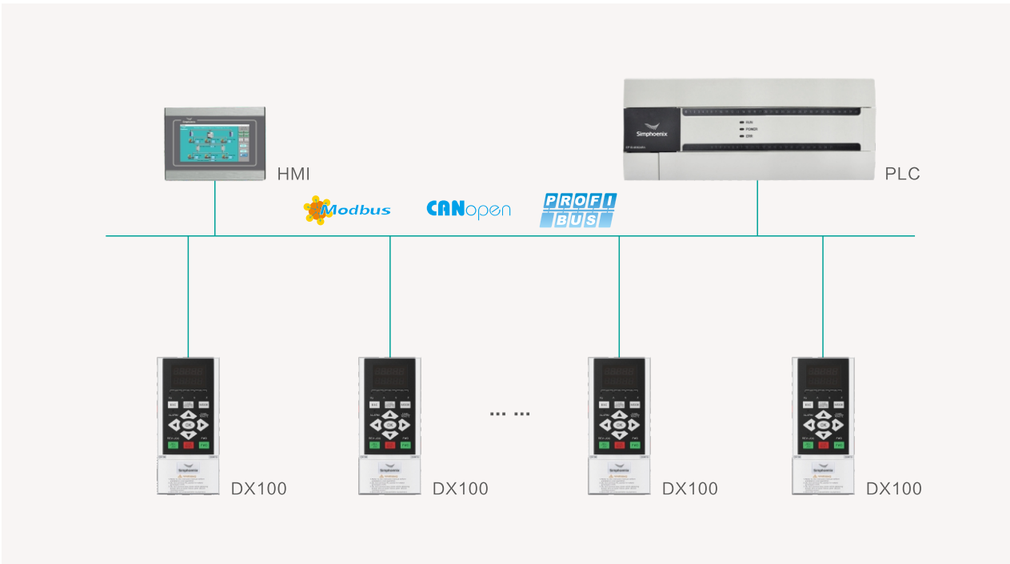


IO expansion card：IOV-D104、IOV-A102、IOV-A103、IOV-A110、IOV−A113、IOV−D112

Communication adapter card：IOV-D105、IOV-D109、IOV-D111、IOV-E108、IOV-B106

Industry Expansion Card：APV-F301、APV-B300、APV-E309、APV-E303、APV-A310、 APV-I312 main card）、APV-J313 vice card）

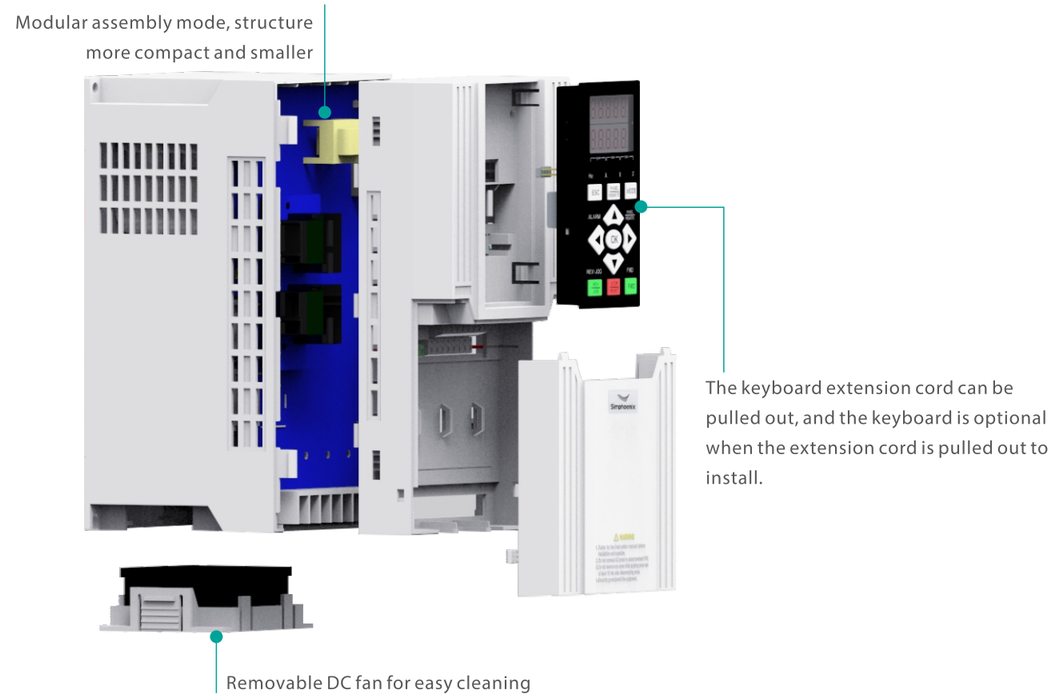
◆ Support Modbus−RTU, Profibus−DP, CANopen bus protocol



Note：CANopen and Profibus-DP communication are only available for DX100-4T0110 and above models.

Structure

- Use DC fan for heat dissipation, good heat dissipation effect, stable performance, easy to disassemble and clean
- Enhanced double-layer conformal coatings to ensure the safety and reliability of the circuit part



Naming Rule

DX100−4 T 0015 (B)

model
DX100 series vector universal inverter

voltage classes	
4	AC−380V
2	AC−220V

power phase	
T	three phase
S	single phase

derivative model	
B	with brake unit (above 4T0075)

adpater motor（kW）	
0007	0.75
0011	1.1
0015	1.5
...	...
1100	110

Specifications

input and output	Rated voltage	single-phase(2S#)220V(±10%)	Three-phase (4T#) 380~415V(±10%
	frequency	50/60Hz(±5%)	
	output voltage	0~input voltage	
	Output frequency	Low frequency running mode：0.00~300.00Hz high frequency running mode：0.00~1000.00Hz	
	Digital input	● Below DX100-2S0040/4T0075：5digital inputs are standard（DI） ● Above DX100-4T0110：6 digital inputs are standard（DI），can be expanded to 16 channels (optional expansion components)	
	Digital output	2 digital outputs are standard（DO）	
	Pulse input	Above DX100-4T0110：0～100.0KHz pulse input，connected to NPN type OC output (optional)	
	Pulse output	Above DX100-4T0110：0～100.0KHz pulse NPN type OC output (optional), can choose PWM output mode to expand the analog output port	
	Analog input	Standard configuration：0～10V voltage input/0～20mA current input optional configuration：-10～10V input（above 4T0110）	
	Analog output	Below DX100-2S0040/4T0075： 1 channel 0～10V analog output signal（0～20mA current output mode can be selected） Above DX100-4T0110： 2 channels 0～10V analog output signal（0～20mA current output mode can be selected）	
	Contact output	Standard set of AC 250V/2A normally open, normally closed contacts, expandable 1 to 6 groups of normally open, normally closed contacts	
	RS485	7.5kW and below models are standard	11kW and above models optional
control characteristics	Control method	Open loop vector control	V/F control
	Starting torque	0 speed 180%	0 zero 180%
	Speed range	1：200	1：100
	Stable speed accuracy	±0.2%	±0.5%
	Torque control accuracy	±5%	——
	Torque response time	≦25ms	——
	Frequency accuracy	Low frequency mode：0.01Hz；high frequency mode：0.1Hz	
	Frequency resolution	●Low frequency mode：digital setting—0.01Hz、analog setting—maximum frequency×0.1% ●high frequency mode:digital setting—0.1Hz、analog setting—maximum frequency×0.1%	
	Load capacity	110%--long time；150%--60 sec；180%--2.5 sec	
	Carrier frequency	Three-phase voltage vector synthesis mode: 1.5~8KHz：1.5~8KHz； Two-phase voltage vector synthesis mode: 1.5~12KHz：1.5~12KHz； The specific carrier frequency is related to the power level	
	Acc and dec time	0.01~600.00Sec. / 0.01~600.0Min	
	Flux brake	By increasing the motor flux (30~120% can be set), the motor can be quickly decelerated and braked	
	DC braking/holding brake	DC brake/brake initial frequency: 0.0~upper limit frequency, brake/brake injection current 0.0~100.0%	
	Start frequency	0.0~50.0Hz	

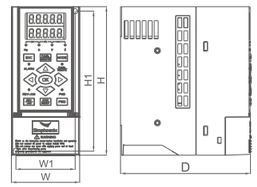
typical function	Multi-stage operation	16-segment frequency/speed operation, each segment's running direction, time, acceleration and deceleration are independently set; 7-segment process PID setting
	Built-in PID	Built-in PID controller, which can be used independently by external equipment
	Wake up to sleep	Built-in PID has simple sleep and wake-up functions
	MODBUS	Standard MODBUS communication protocol, flexible parameter reading and writing mapping function
	Dynamic braking	Operating voltage: 340~400/650~800V, braking rate: 50~100%
	General function	Power failure restart, fault self-recovery, motor parameter dynamic/static self-identification, start permission enable, run permission enable, start delay, overcurrent suppression, overvoltage/undervoltage suppression, V/F custom curve, analog input Curve correction, disconnection detection, textile machinery disturbance (swing frequency) operation
special function	Virtual I/O port	With 8 one-to-one corresponding virtual output and input ports No need for external wiring to easily realize complex project site applications
	Communication linkage synchronization	Easily realize multi-machine synchronous transmission and can freely choose to realize multi-machine linkage balance according to current, torque, and power
	Load balancing	It can also realize the dynamic balance of multi-machine load (not limited to communication linkage), and realize the characteristics of torque motor
	Strong starting torque	For loads with large inertia and high static friction, a super starting torque can be set for a certain period of time
	Set priority	Users can freely select the priority order of various frequency/speed setting channels, suitable for combined applications in various occasions
	Set combination	Up to hundreds of combinations of frequency, speed, torque and other settings
	Timer	3 built-in timers: 5 types of clocks, 5 types of start trigger modes, Multiple gating signals and working modes, 7 output signals
	counter	2 built-in counters: clock edge selection, 4 types of start trigger modes, 7 output signals
	Macro parameter	Application macro: Conveniently set and partially solidify a variety of commonly used group parameters, simplifying parameter settings for general applications System macro: It is convenient to switch the working mode of the equipment (such as high and low frequency operation mode switching), And automatically redefine local parameters
	Parameter debugging	ny unstored parameter in the field debugging can be stored or discarded and restored to the original value with one key
	Parameter display	Automatically shield the parameters of unused function modules, or selectively display modified, stored, and changed parameters
protection	power supply	Undervoltage protection
	Run protection	Overcurrent protection, overvoltage protection, inverter overheating protection, inverter overload protection, motor overload protection, output phase loss protection, IGBT drive protection
	Equipment abnormal	Current detection abnormality, EEPROM memory abnormality, control unit abnormality, motor overheating, temperature acquisition loop failure
	Motor connection	The motor is not connected, the three-phase parameters of the motor are unbalanced, and the parameter identification is wrong
	Expansion Card	Detect and protect whether the expansion card is compatible or conflict
Environment	Installation Environment	Indoor vertical installation, no direct sunlight, no dust, corrosive, flammable gas, no oil mist, water vapor, no dripping water or salt
	Altitude	0~1000 meters; 1000~3000 meters is recommended for derating, and the output current capacity is derated by 10% for every 1000 meters
	Ambient temperature	Working environment temperature: -10℃～+45 ℃ (45℃~50℃ derating use)
	Storage temperature	-20℃～+60 ℃
	Humidity	Below 95%, no condensation of water droplets
	vibration	$< 6m/s^2$
	Environmental pollution level	2
	Protection level	IP20

Model table

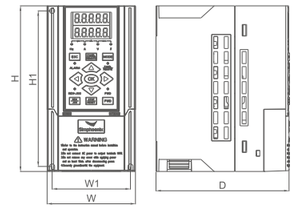
voltage clasee	model	rated capacity（KVA）	adapter motor（kW）	rated output current（A）
single phase 220V	DX100-2S0007(B)	1.9	0.75	5.0
	DX100-2S0015(B)	2.9	1.5	7.5
	DX100-2S0022(B)	3.8	2.2	10.0
	DX100-2S0030(B)	5.3	3.0	14.0
	DX100-2S0040(B)	6.3	4.0	16.5
three phase 380V~415V(±10%)	DX100-4T0011(B)	2.0	1.1	3.0
	DX100-4T0015(B)	2.4	1.5	3.7
	DX100-4T0022(B)	3.6	2.2	5.5
	DX100-4T0040(B)	6.3	4.0	9.5
	DX100-4T0055(B)	8.6	5.5	13.0
	DX100-4T0075(B)	11.2	7.5	17.0
	DX100-4T0110	16.5	11	25
	DX100-4T0150	21.7	15	33
	DX100-4T0185	25.7	18.5	39
	DX100-4T0220	29.6	22	45
	DX100-4T0300	39.5	30	60
	DX100-4T0370	49.4	37	75
	DX100-4T0450	62.5	45	95
	DX100-4T0550	75.7	55	115
	DX100-4T0750	98.7	75	150
	DX100-4T0900	116	90	176
	DX100-4T1100	138	110	210
	DX100-4T1320※	171	132	260
	DX100-4T1600※	204	160	310
	DX100-4T1850※	237	185	360
	DX100-4T2000※	253	200	385
	DX100-4T2200※	276	220	420
	DX100-4T2500※	313	250	475
	DX100-4T2800※	352	280	535
	DX100-4T3150※	395	315	600

Note：※represents the model under development

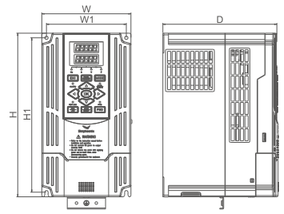
Mounting dimension



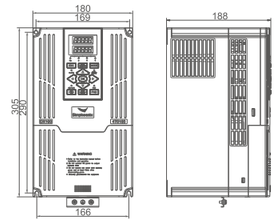
Class Ⅰ applicable model
DX100-4T0011(B)~ DX100-4T0015(B)
DX100-2S0007(B)~ DX100-2S0015(B)



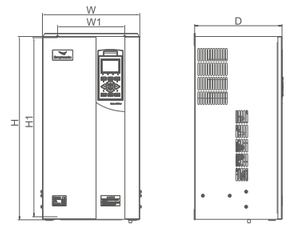
Class Ⅱ applicable model
DX100−2S0022(B)~ DX100−2S0040(B)
DX100−4T0022(B)~ DX100−4T0075(B)



Class Ⅱ applicable model
DX100−4T0110~DX100−4T0450



Note :two special models :
DX100-4T0185~DX100-4T0220



Class Ⅳ applicable model
DX100-4T0550~DX100-4T1100

model	W1 (mm)	W (mm)	H1 (mm)	H (mm)	D (mm)	screw specification
DX100-2S0007(B)	59	68	139	148	130	M4
DX100-2S0015(B)						
DX100-4T0011(B)						
DX100-4T0015(B)						
DX100-2S0022(B)	78	88	155	165	133	M4
DX100-2S0030(B)						
DX100-4T0022(B)						
DX100-4T0040(B)						
DX100-2S0040(B)	99	109	199	209	155	M4
DX100-4T0055(B)						
DX100-4T0075(B)						
DX100-4T0110	121	135	234	248	175	M4
DX100-4T0150	146	160	261	275	179	M5
DX100-4T0185	169	180	290	305	188	M5
DX100-4T0220	166					
DX100-4T0300	160	210	387	405	211	M6
DX100-4T0370	160	250	422	445	216	M8
DX100-4T0450						
DX100-4T0550	200	290	525	545	260	M8
DX100-4T0750						
DX100-4T0900	230	330	603	625	280	M10
DX100-4T1100						

Wiring diagram