

## DX100 Series

Open-loop Vector Frequency Converter

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TO BE OUTSTANDING AUTOMATION PRODUCT AND SOOLUTION 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

18 Overseas sales network

35 Offices

Timely response to the customer requirements

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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.



# Introduction

## DX100 Series Open-loop Vector Frequency Converter

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 tools, Textile, Food machinery, Glass machinery, cable machinery, Road construction materials, Petrochemicals, Centrifuges, Fans and pumps, etc.



# Product Features

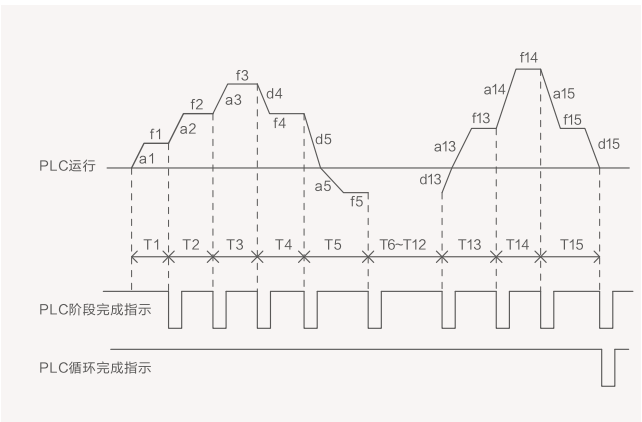
## Innovations

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



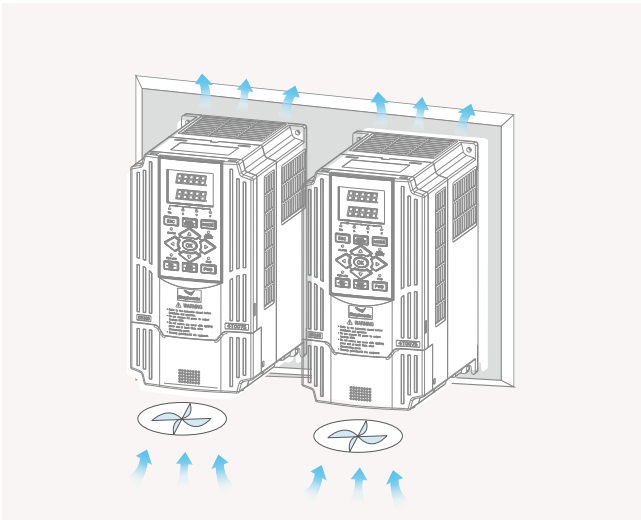
## Software

- 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.



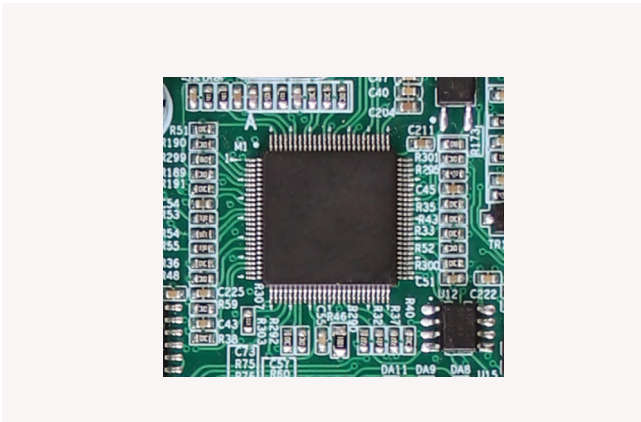
## Structure

- 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.



## 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.

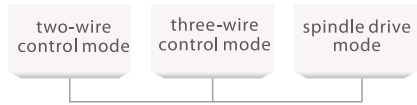


More powerful software functions

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.

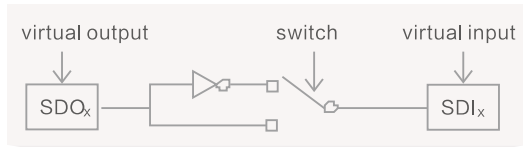
◆ Application macro parameter

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

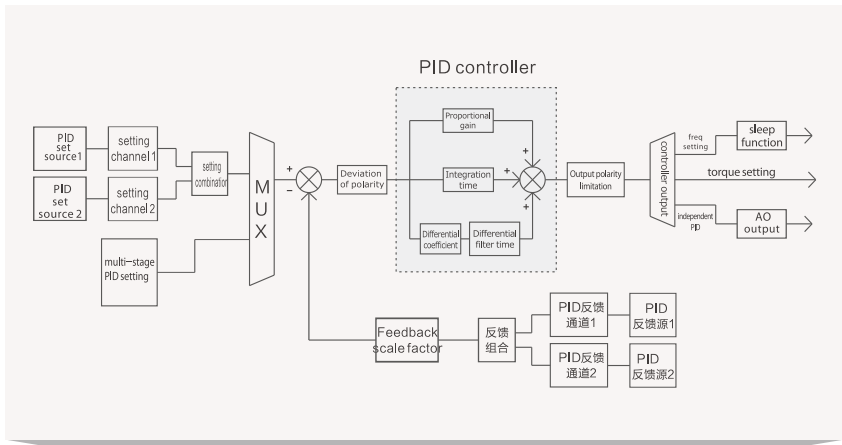
By setting the mapping function parameters, multiple parameters can be read continuously in one frame of instruction. When the customer uses the host computer to communicate with the inverter, they can obtain multiple non-continuous parameters more quickly and conveniently.



Multiple function parameters of non-contiguous addresses      Parameters stored in consecutive address units

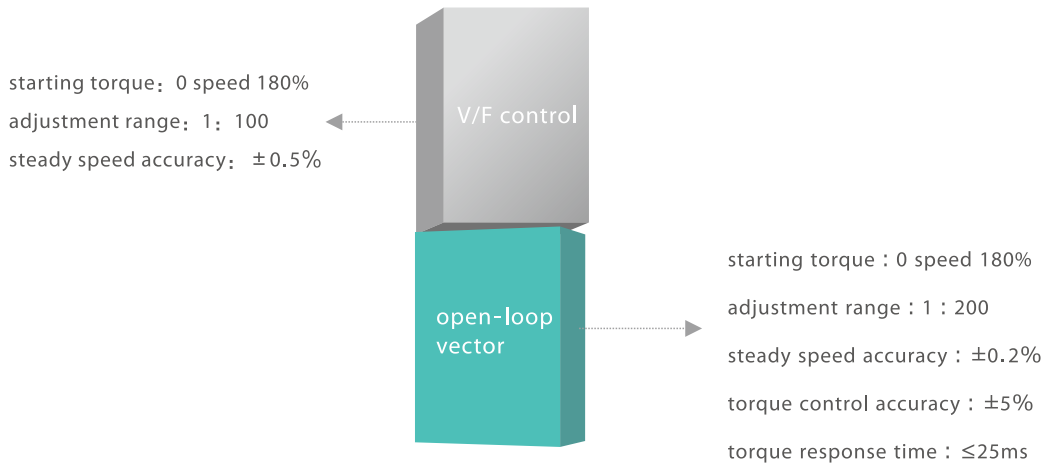
◆ Built-in PID function

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.



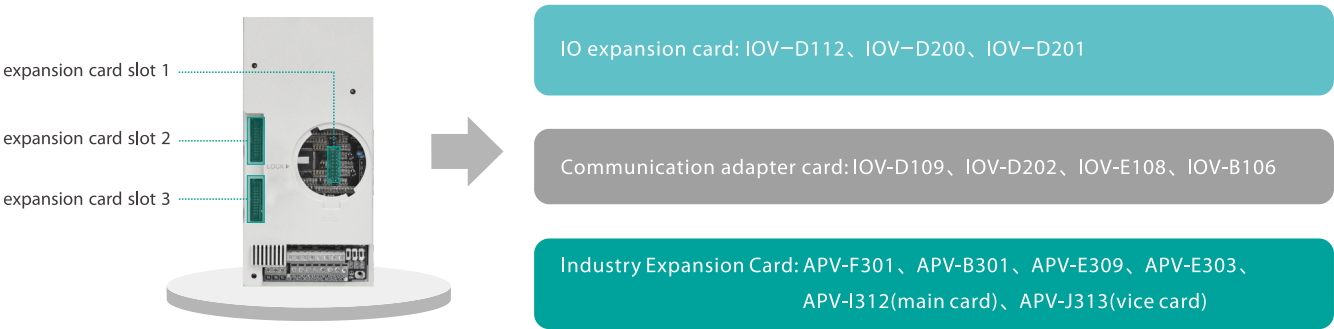
Stricter product testing standards

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

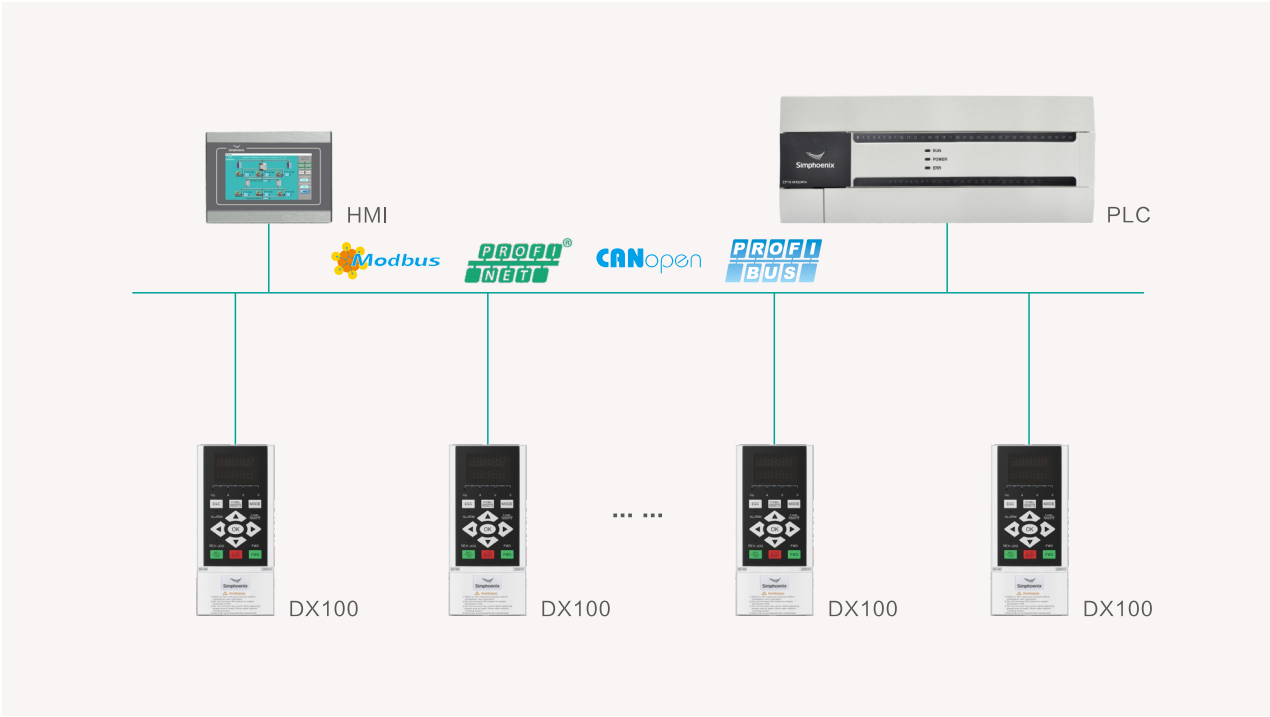
| Item                                                  |                    | test result                       | standard    |
|-------------------------------------------------------|--------------------|-----------------------------------|-------------|
| Insulation resistance                                 |                    | > 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<br>freq. range 150KHz~80MHz ) |                    | 10V ( e.m.f )                     | EN61000-4-6 |

Product upgrades and change

◆ More abundant I/O interface for Industry 4.0



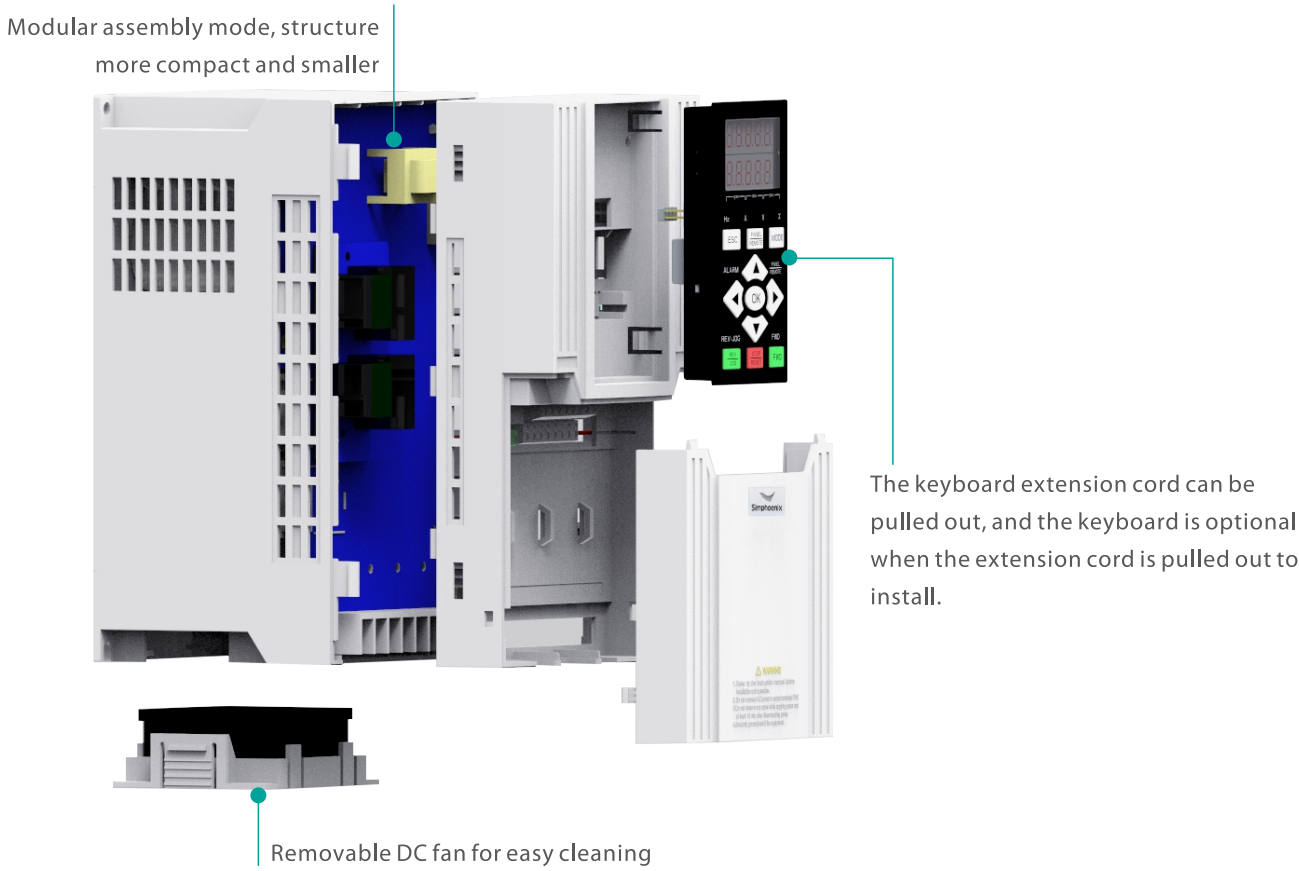
◆ Support Modbus-RTU, PROFINET, Profibus-DP, CANopen bus protocol



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)Q

| Model                                  |  |
|----------------------------------------|--|
| DX100 series Open-loop Vector Inverter |  |

| Voltage classes |         |
|-----------------|---------|
| 4               | AC-380V |
| 2               | AC-220V |

| Power phase |              |
|-------------|--------------|
| T           | three phase  |
| S           | single phase |

| Derivative model |                               |
|------------------|-------------------------------|
| B                | with brake unit (above 7.5kW) |

| Adpater motor ( kW ) |      |
|----------------------|------|
| 0007                 | 0.75 |
| 0011                 | 1.1  |
| 0015                 | 1.5  |
| ...                  | ...  |
| 3500                 | 350  |

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<br>high frequency running mode: 0.00~400.00Hz                                                                                     |                                  |
|                         | Digital input            | ● 5digital inputs are standard ( DI )<br>● Above DX100-4T0110: 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),<br>can choose PWM output mode to expand the analog output port                                        |                                  |
|                         | Analog input             | Standard configuration: 0 ~ 10V voltage input/0 ~ 20mA current input<br>optional configuration: -10 ~ 10V input ( above 4T0110 )                                            |                                  |
|                         | Analog output            | 1 channel 0 ~ 10V analog output signal ( 0 ~ 20mA current output mode can be selected )                                                                                     |                                  |
| control characteristics | 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                                                                                                                                         | 11 kW and above models optional  |
|                         | 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%<br>●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;<br>Two-phase voltage vector synthesis mode: 1.5~12KHz;<br>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<br>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                                                                                                                                                                                                                                         |
| protection       | Parameter display                     | Automatically shield the parameters of unused function modules, or selectively display modified, stored, and changed parameters                                                                                                                                                                                                                                 |
|                  | 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                                                                                                                                                                   |
| Environment      | 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                                                                                                                                                                                                                                                                                         |
|                  | 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 <sup>2</sup>                                                                                                                                                                                                                                                                                                                                             |
|                  | Environmental pollution level         | 2                                                                                                                                                                                                                                                                                                                                                               |
|                  | Protection level                      | IP20                                                                                                                                                                                                                                                                                                                                                            |

Model table

| voltage clasee                  | model            | rated capacity ( KVA ) | adaptr motor ( kW ) | rated output current ( A ) |
|---------------------------------|------------------|------------------------|---------------------|----------------------------|
| single phase<br>220V            | DX100-2S0007(B)Q | 1.9                    | 0.75                | 5.0                        |
|                                 | DX100-2S0015(B)Q | 2.9                    | 1.5                 | 7.5                        |
|                                 | DX100-2S0022(B)Q | 3.8                    | 2.2                 | 10.0                       |
|                                 | DX100-2S0030(B)Q | 5.3                    | 3.0                 | 14.0                       |
|                                 | DX100-2S0040(B)Q | 6.3                    | 4.0                 | 16.5                       |
| three phase 380V~<br>415V(±10%) | DX100-4T0011(B)Q | 2.0                    | 1.1                 | 3.0                        |
|                                 | DX100-4T0015(B)Q | 2.4                    | 1.5                 | 3.7                        |
|                                 | DX100-4T0022(B)Q | 3.6                    | 2.2                 | 5.5                        |
|                                 | DX100-4T0040(B)Q | 6.3                    | 4.0                 | 9.5                        |
|                                 | DX100-4T0055(B)Q | 8.6                    | 5.5                 | 13.0                       |
|                                 | DX100-4T0075(B)Q | 11.2                   | 7.5                 | 17.0                       |
|                                 | DX100-4T0110Q    | 16.5                   | 11                  | 25                         |
|                                 | DX100-4T0150Q    | 21.7                   | 15                  | 33                         |
|                                 | DX100-4T0185Q    | 25.7                   | 18.5                | 39                         |
|                                 | DX100-4T0220Q    | 29.6                   | 22                  | 45                         |
|                                 | DX100-4T0300Q    | 39.5                   | 30                  | 60                         |
|                                 | DX100-4T0370Q    | 49.4                   | 37                  | 75                         |
|                                 | DX100-4T0450Q    | 62.5                   | 45                  | 95                         |
|                                 | DX100-4T0550Q    | 75.7                   | 55                  | 115                        |
|                                 | DX100-4T0750Q    | 98.7                   | 75                  | 150                        |
|                                 | DX100-4T0900Q    | 116                    | 90                  | 176                        |
|                                 | DX100-4T1100Q    | 138                    | 110                 | 210                        |
|                                 | DX100-4T1320Q    | 171                    | 132                 | 260                        |
|                                 | DX100-4T1600Q    | 204                    | 160                 | 310                        |
|                                 | DX100-4T1850Q    | 237                    | 185                 | 360                        |
|                                 | DX100-4T2000Q    | 253                    | 200                 | 385                        |
|                                 | DX100-4T2200Q    | 276                    | 220                 | 420                        |
|                                 | DX100-4T2500Q    | 313                    | 250                 | 475                        |
|                                 | DX100-4T2800Q    | 352                    | 280                 | 535                        |
|                                 | DX100-4T3150Q    | 395                    | 315                 | 600                        |
|                                 | DX100-4T3500Q    | 428                    | 350                 | 650                        |

Mounting dimension

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

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

Class II applicable model  
DX100-4T0110Q~DX100-4T0450Q

Note :two special models :  
DX100-4T0185Q~DX100-4T0220Q

Class IV applicable model  
DX100-4T0550Q~DX100-4T1600Q

| model            | W1 (mm) | W (mm) | H1 (mm) | H (mm) | D (mm) | screw specification |
|------------------|---------|--------|---------|--------|--------|---------------------|
| DX100-2S0007(B)Q | 59      | 68     | 139     | 148    | 130    | M4                  |
| DX100-2S0015(B)Q |         |        |         |        |        |                     |
| DX100-4T0011(B)Q |         |        |         |        |        |                     |
| DX100-4T0015(B)Q |         |        |         |        |        |                     |
| DX100-2S0022(B)Q | 78      | 88     | 155     | 165    | 133    | M4                  |
| DX100-2S0030(B)Q |         |        |         |        |        |                     |
| DX100-4T0022(B)Q |         |        |         |        |        |                     |
| DX100-4T0040(B)Q |         |        |         |        |        |                     |
| DX100-2S0040(B)Q | 99      | 109    | 199     | 209    | 155    | M4                  |
| DX100-4T0055(B)Q |         |        |         |        |        |                     |
| DX100-4T0075(B)Q |         |        |         |        |        |                     |
| DX100-4T0110Q    | 121     | 135    | 234     | 248    | 175    | M4                  |
| DX100-4T0150Q    | 146     | 160    | 261     | 275    | 179    | M5                  |
| DX100-4T0185Q    | 169     | 180    | 290     | 305    | 188    | M5                  |
| DX100-4T0220Q    | 166     |        |         |        |        |                     |
| DX100-4T0300Q    | 160     | 210    | 387     | 405    | 211    | M6                  |
| DX100-4T0370Q    | 160     | 250    | 428     | 445    | 216    | M8                  |
| DX100-4T0450Q    |         |        |         |        |        |                     |
| DX100-4T0550Q    | 200     | 290    | 525     | 545    | 260    | M8                  |
| DX100-4T0750Q    |         |        |         |        |        |                     |
| DX100-4T0900Q    | 230     | 330    | 603     | 625    | 280    | M10                 |
| DX100-4T1100Q    |         |        |         |        |        |                     |
| DX100-4T1320Q    | 280     | 380    | 760     | 785    | 300    | M10                 |
| DX100-4T1600Q    |         |        |         |        |        |                     |
| DX100-4T1850Q    | 320     | 450    | 919     | 945    | 300    | M10                 |
| DX100-4T2000Q    |         |        |         |        |        |                     |
| DX100-4T2200Q    |         |        |         |        |        |                     |
| DX100-4T2500Q    | 350     | 480    | 1022    | 1050   | 300    | M12                 |
| DX100-4T2800Q    | 480     | 550    | 1116    | 1145   | 300    | M12                 |
| DX100-4T3150Q    |         |        |         |        |        |                     |
| DX100-4T3500Q    |         |        |         |        |        |                     |

Wiring diagram

