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(V1.1–2026.01)

CE SGS RoHS

Cabinet Inverter for Commercial Central air Conditioning

Product Selection >>>

Simphoenix

Founded in 2004, Shenzhen Simphoenix Electric Technology Co., Ltd. is a leading enterprise specializing in industrial automation. The company focuses on R&D, production, and sales of high-quality industrial automation products, including frequency converters, servo drives, permanent magnet synchronous motors, PLCs, and HMI systems. Additionally, its wholly-owned subsidiary, Huizhou Simphoenix Electric Co., Ltd., is dedicated to the automation sector. Working closely with the parent company, it strives to provide customers with top-tier products and solutions.

With over two decades of industry expertise, Simphoenix has emerged as a leading domestic industrial automation brand, distinguished by its comprehensive product portfolio and robust R&D capabilities.

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TS5600 series high performance air-cooled cabinet inverter

The TS5600 series is specifically designed for the central air conditioning refrigeration industry, built upon Simphoenix's cutting-edge V-series vector frequency converter hardware and software platform. Building on the V-series' proven performance, robust functionality, and reliability, these compact units integrate all essential control and frequency drive functions for central air conditioning systems. They require no external control circuits or systems, significantly reducing installation space while simplifying setup, debugging, and maintenance.

The TS5600 series high-performance air-cooled cabinet inverter is the first choice for the new generation of central air-conditioning screw frequency converter and small cooling capacity centrifugal unit design scheme because of its excellent performance, powerful function, high power density and high reliability.

Product features

■ The output torque is high at low speed and 180% of the starting torque at zero speed;

■ The dual-line LED or LCD panel display allows customers to monitor and debug simultaneously.

■ It has built-in system macro and application macro, which can simplify parameter setting by macro parameter call.

■ The RS485 communication interface is provided as the upper computer control, which can complete the start, stop control command and running frequency instruction issued by the system, and realize the speed control.

■ Modular design and optimized drive protection function ensure the product is more stable and reliable.

■ The independent air duct design ensures electrical isolation.

■ The entire series comes with built-in DC reactors as standard, offering higher input power factor and reduced current harmonics.

■ The secondary control circuit of the integrated screw unit is very convenient to install and debug.

■ Extensive external terminals: including start/stop control commands, operation/fault signal outputs, frequency setting, current information output, power supply output, emergency stop button, etc.

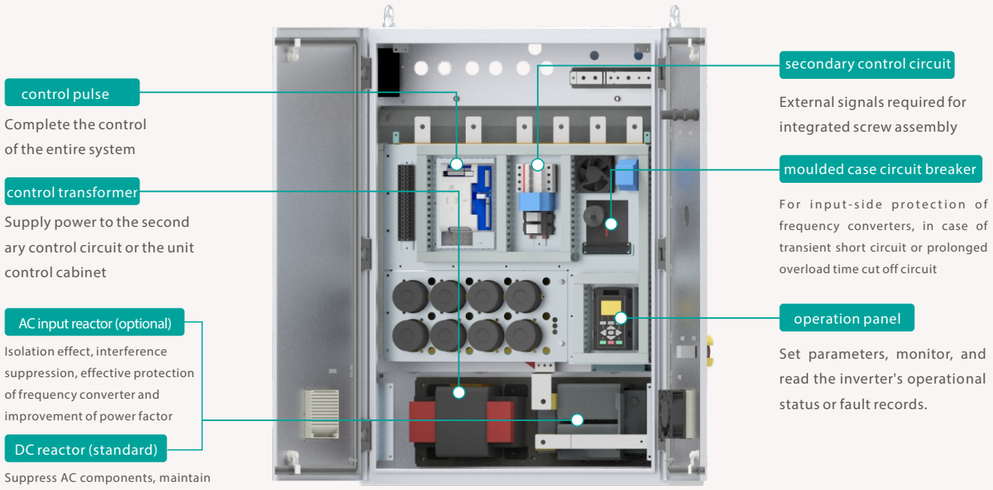
Typical applications

Screw-Type Water-Cooled Chiller Unit

Product structure

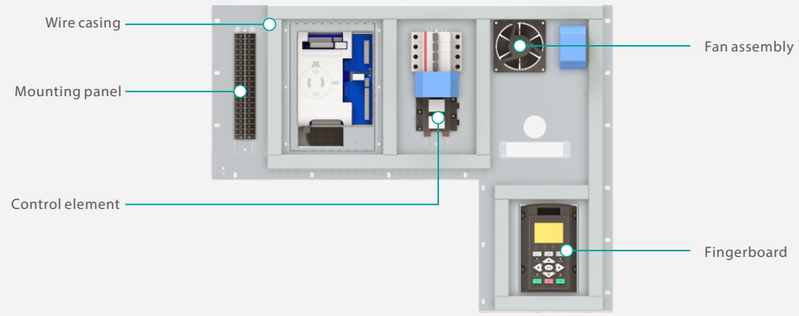
◆All-in-One Cabinet Design

The product features an integrated design with an attractive appearance, a compact and rational structure, and clear layers. It is easy to install, debug, and maintain, equipped with multiple dynamic monitoring functions to provide real-time insights into the system's operational status.

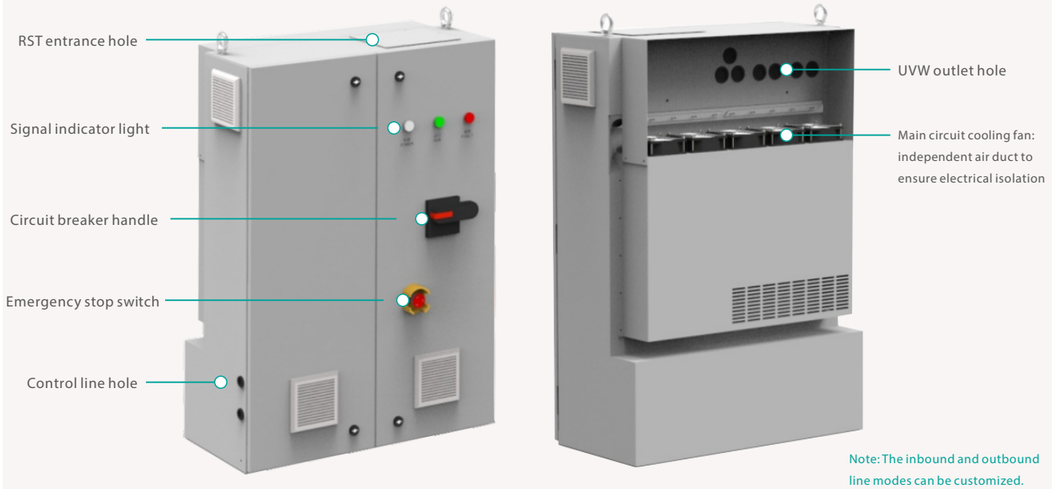


◆Secondary Control Circuit Design

The system integrates the docking signals of screw unit, including start and stop command of terminal, fault reset, operation feedback signal, fault feedback signal, power failure detection signal, frequency setting of frequency converter, 485 communication, etc.



Product appearance



Note: The inbound and outbound line modes can be customized.

Product technology and specifications

Input and Output	Input Voltage (U1), Frequency	3-phase (4T# series) 380V ±15%　50/60Hz (415V~460V customizable)	
	Output voltage	4T#series：0~380 V	
	Output frequency	Low frequency running mode：0.0~300.00Hz	
	Digital input	Standard Configuration: 6 Channels of Digital Inputs（DI）	
	Digital output	Standard Configuration: 2 Channels of Digital Outputs（DO）	
	Analog input	Standard configuration: 0-10V voltage input (Ai1); 0-20mA current input (AI2)	
	Analog output	2 channel 0~10V analog output (with optional 0~20mA current output mode)	
	Contact output	Standard: Two Sets of AC 250V/2A Normally Open and Normally Closed Contacts	
Control Characteristics	Input and output	O pen-loop Vector Control	V/F control
	Starting torque	0 Speed 180%	0 Speed 180%
	Speed range	1:200	1:100
	Speed Stability Accuracy	±0.2%	±0.5%
	Torque Control Precision	±5%	- -
	Torque Response Time	≤25ms	- -
	Frequency Resolution	0.01Hz	
	Frequency accuracy	Digital setting--0.01Hz, Max frequency×0.1%	
	Load Capacity	105%--long time；150%--60 sec；180%--5 sec	

Control Characteristic	Carrier Frequency	2~5.0kHz
	Acc and Dec Time	0.01~600.00Sec
	Flux Braking	By increasing the motor flux (adjustable from 30% to 120%), rapid deceleration braking of the motor can be achieved.
	DC Braking / Holding Brak	DC braking/braking starting frequency: 0.0~upper limit frequency, braking/braking injection current 0.0~100.0%
	Start Frequency	0.0~50.00Hz
	Multi-Stage Operation	16-Stage Frequency/Speed Operation, with each stage allowing independent setting of direction, time, acceleration, and deceleration; 7-Stage PID Setting for Process
Typical Function	Built-in PID	Built-in with two PID controllers (Process PID, Compensation PID), which can be independently used by external devices and can also be used to establish complex internal compensation control.
	Wake-up from Sleep	The Process PID features concise sleep and wake-up functions.
	MODBUS	Standard MODBUS Communication Protocol (Optional), with flexible parameter read/write mapping function
	Temperature inspection	Capable of receiving signals from PT100 or PTC temperature-sensitive elements, enabling over-temperature protection for motors or external devices.
	Ordinary function	Power Failure Restart, Fault Auto-Recovery, Dynamic/Static Self-Identification of Motor Parameters, Start Enable, Run Enable, Start Delay, Overcurrent Suppression, Overvoltage/Undervoltage Suppression, Custom V/F Curve, Analog Input Curve Correction, Disconnection Detection, Textile Machinery Disturbance (Weft Frequency) Operation
Features	Macro parameter	App Macro: Conveniently set and partially solidify various commonly used group parameters, simplifying parameter settings for general application scenarios. System Macro: Facilitate switching between different operating modes of the equipment (such as high and low-frequency operation mode switching) and automatically redefine local parameters.
	Parameter tuning	Any unsaved parameters during on-site debugging can be stored or abandoned with a single key press, restoring them to their original values if necessary
	Parameter display	Automatically mask parameters for unused functional modules or selectively display parameters that have been modified, stored, or changed.
Protection	Power supply	Undervoltage Protection, Three-Phase Power Supply Imbalance Protection
	Operational Protection	Overcurrent Protection, Overvoltage Protection, Inverter Overheat Protection, Inverter Overload Protection, Motor Overload Protection, Output Phase Loss Protection, Module Drive Protection
	Abnormality	Current Detection Abnormality, EEPROM Memory Abnormality, Control Unit Abnormality, Motor Overheat, Magnetic Contactor Fault, Temperature Acquisition Circuit Fault
	Motor Connection	Motor Not Connected, Unbalanced Three-Phase Parameters of the Motor, Parameter Identification Error
	Expansion card	Detection and Protection Expansion Cards Compatibility or Conflict Check
Environment	Installation environment	Indoor Vertical Installation, Not Exposed to Direct Sunlight, Free from Dust, Corrosive, Flammable Gases, Oil Mist, Water Vapor, Dripping Water, or Salt Content
	Altitude	0~1000 meters. For every 1000 meters increase in altitude, the output current capacity decreases by 10%. The maximum altitude is 3000 meters.
	Temperature	Operating Environment Temperature: -10℃~ +40℃ (For temperatures +40℃~ +50℃, please reduce usage capacity. For every 1℃ increase, reduce capacity by 2%). Customized operating environment temperature can be specified from -20℃ to +50℃. Storage Environment Temperature: -25℃ ~ +60℃.
	Humidity	Below 95%, No Condensation
	Vibration	< 20m/s^2
	Protection grade	IP22, customizable IP54 solution

Key technical indicators

Power factor	⩾0.92
Overall efficiency	⩾97%
Grid-side current harmonic distortion rate (THDi)	⩽35%
	⩽5% or ⩽10%（optional APF）

Note: The above technical parameters are measured at 100% load after the inverter is equipped with either an AC input reactor or a DC reactor.

Naming rules

TS5600 – 4 T 2500 – GX

Product serial number

Voltage level

4	380V

Power phase

T	three-phase

Power level（kW）

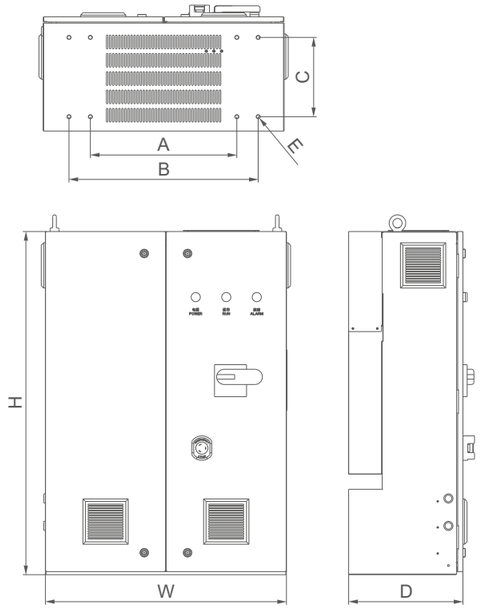
0550	55
0750	75
⋮	⋮
4000	400
4500	450

Other special codes

Model table

Model	Load of screw machine		
	Rated current（A）	Rated capacity（KVA）	Adapted motor（kW）
TS5600-4T0550	115	75.7	55
TS5600-4T0750	150	98.7	75
TS5600-4T0900	176	116	90
TS5600-4T1100	210	138	110
TS5600-4T1320	260	171	132
TS5600-4T1600	310	204	160
TS5600-4T1850	360	237	185
TS5600-4T2000	385	253	200
TS5600-4T2200	420	276	220
TS5600-4T2500	475	313	250
TS5600-4T2800	535	352	280
TS5600-4T3150	600	395	315
TS5600-4T3500	650	428	350
TS5600-4T4000	730	480	400
TS5600-4T4500	800	527	450

Installation size



Model（three-phrase 380V）	W (mm)	H (mm)	D (mm)	A (mm)	B (mm)	C (mm)	Screw
TS5600-4T0550	600	950	340	400	540	230	M12
TS5600-4T0750							
TS5600-4T0900							
TS5600-4T1100	790	1125	340	480	620	225	M12
TS5600-4T1320							
TS5600-4T1600							
TS5600-4T1850							
TS5600-4T2000	900	1230	340	620	760	210	M12
TS5600-4T2200							
TS5600-4T2500							
TS5600-4T2800							
TS5600-4T3150							
TS5600-4T3500	940	1400	360	580	720	230	M12
TS5600-4T4000	1100	1400	360	740	880	230	M12
TS5600-4T4500							

TS6000 Series High Performance Water-Cooled Cabinet Inverter

The TS6000 Series is specifically developed for the central air conditioning refrigeration industry, based on Simphoenix's cutting-edge V-series high-performance vector frequency converter software and hardware platform. These dedicated cabinet-type units not only inherit the V-series' excellent performance, powerful functionality, and reliable quality but also feature a more compact design, superior manufacturing craftsmanship, and wide power coverage. Additionally, they integrate all control and frequency drive functions required by central air conditioning units, significantly reducing installation space while simplifying installation, commissioning, and maintenance. The units also come with a built-in water-cooling control system to effectively prevent condensation, ensuring long-term high-efficiency operation.

TS6000 High Performance Water-Cooled Cabinet Inverter is the first choice of the new generation of central air-conditioning inverter centrifugal unit design scheme because of its excellent performance, powerful function, high power density and high reliability.

Product features

- The current loop response time is as fast as 75μs, and the starting torque is 200% at zero speed.
- The dual-line LED or LCD panel display allows customers to monitor and debug simultaneously.
- It has built-in system macro and application macro, which can simplify parameter setting by macro parameter call.
- The RS485 communication interface is provided as the upper computer control, which can complete the start, stop control command and running frequency instruction issued by the system, and realize the speed control.
- The water cooling heat dissipation effect is better; the external circulation water temperature range is wide (5℃~35℃) can meet the heat dissipation demand;
- Water cooling antifreeze control design;
- high integration and high power density;
- The second control loop of the integrated centrifugal unit is not needed, and the installation and debugging are very convenient.
- The rich external terminal includes start and stop control command, operation and fault signal output, frequency setting, output current information, power supply output, emergency stop button, etc.
- High protection level IP54 scheme can be customized in full power section.

Typical applications

central air conditioning centrifugal unit

Application scheme

◆Application of Frequency Conversion in Central Air Conditioning Water-cooled Unit (Main Unit)

When the unit is cooled by chilled water, the inverter needs to add a three-way valve control scheme. This scheme uses a constant temperature PID control algorithm to precisely regulate the temperature of the internal circulating water flowing through the radiator. It effectively avoids the design challenge of condensation on the radiator surface caused by excessively low chilled water temperature, ensuring the inverter operates efficiently over the long term.

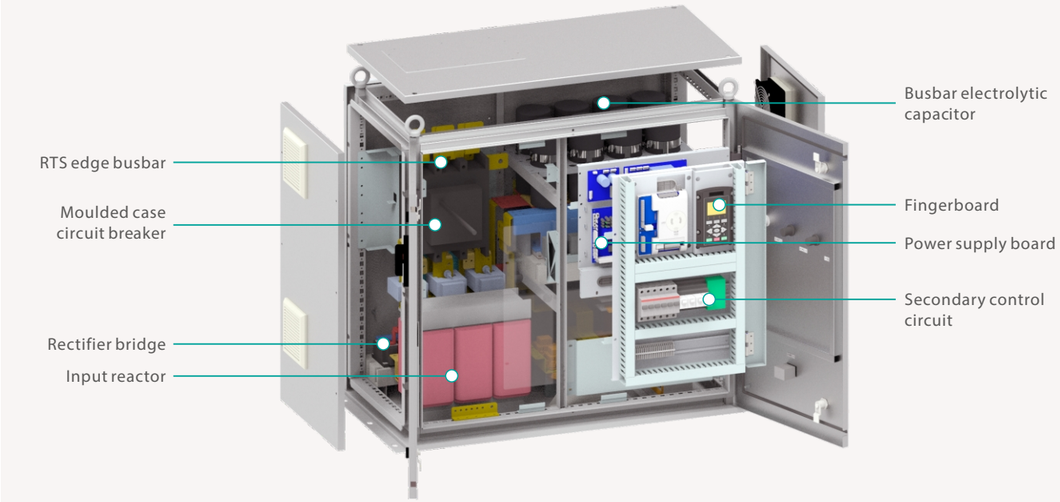
Conditions for connecting air conditioning units

1、External circulating water temperature: 5°C to 35°C
condensation prevention design, allowing direct use of chilled water.
2、External circulation water flow rate: 20L/min to 40L/min.
3、External circulation cooling, with refrigerant cooling method available.

Product structure

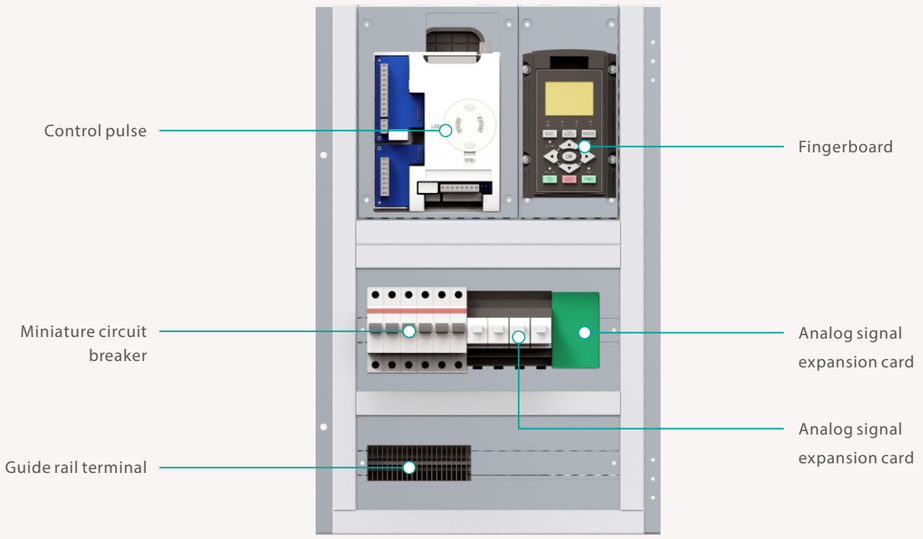
◆Integrated Design

The product features an integrated design with an attractive appearance, a compact and rational structure, and is easy to install and maintain. It is equipped with multiple dynamic monitoring functions to provide real-time monitoring of the system's operationalstatus.

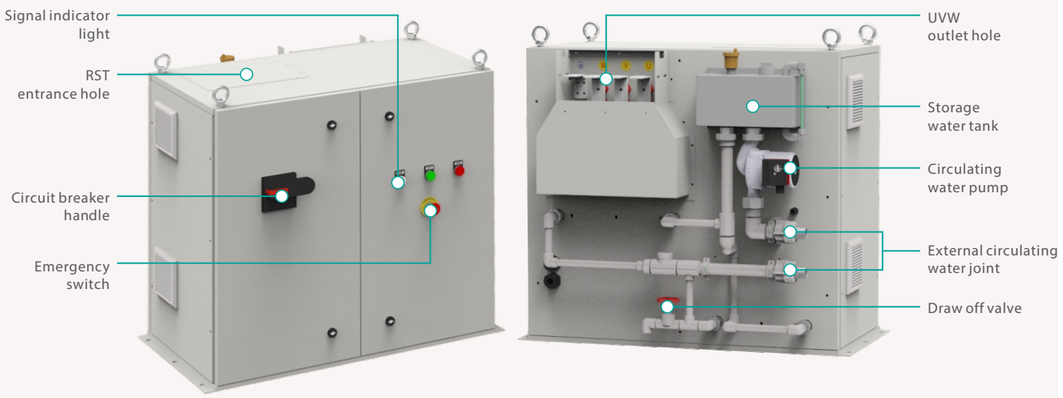


◆Secondary Control Circuit Design

The system integrates all the external signals of the centrifugal unit, including terminal start command, reset command, operation feedback signal, fault signal, power failure detection signal, frequency set of frequency converter, 1 channel standard RS485 communication, etc. No external control loop or system is needed, which is very convenient for the installation, debugging and maintenance of the whole unit.



Product appearance



Product technology and specifications

Input voltage (U1), frequency	Three-phase (4T# series) 380V ± 15% 50/60Hz (415V to 460V customizable)
Output voltage (U2)	4T# series：0~U1
Power range	55kW~1000kW
Output frequency	0.0~300.00Hz
Control panel	The standard dual-row 5-position LED keypad (with optional LCD panel) can be extended via an 8-pin cable for external connection
Digital input	Standard configuration: 6 digital inputs (DI1 ~ Di6)
Digital output	Standard configuration with two digital outputs
Analog input	Standard configuration: 0~10V voltage input (Ai1); 0~20mA current input (AI2) Standard expansion board: PT100 temperature detection input
Analog output	Ao1: Current signal output; AO2: 0~10V analog output signal (can be configured to 0~20mA current output mode)
Contact output	The standard AC configuration includes one AC circuit with 250V/2A rated current, featuring normally open and normally closed contacts.
Monitor-out	One output is for the inverter operation signal, and the other is for the inverter fault signal, which is convenient for external inverter operation status monitoring.
Control method	Open-loop vector control, V/F contro
485 communication	Standard configuration: 485 communication per channel
Starting torque	0 speed 180%
Speed range	1:100
Steady speed accuracy	±0.5%
Frequency resolution	0.01Hz
Frequency accuracy	Digital setting--0.01Hz、Analog setting--maximum frequency×0.1%
Load capacity	110%--long-term;；150%--60 seconds；180%--5 seconds
Carrier frequency	2~5KHz
Acceleration	0.01~600.00Sec.
Start frequency	0.0~50.00Hz
Feature	Fault self-recovery, start enable and run enable, start delay, overcurrent suppression, overvoltage/undervoltage suppression, analog input curve correction, line break detection, temperature detection, macro parameters, strong starting torque
Defencive function	Power protection: under-voltage protection, over-voltage protection Protection modes: Overcurrent protection, inverter overheat protection, inverter overload protection, motor overload protection. Device anomalies: Current detection error, EEPROM memory error, control unit error, motor overheating. Motor connection: Motor not connected; Motor three-phase parameters unbalanced; Parameter identification error Extended protection: Extends fault protection related to the centrifuge; allows addition of clock chips to monitor fault alarm timing
Installation environment	Indoor vertical installation, protected from direct sunlight, free from dust, corrosive gases, flammable gases, oil mist, water vapor, dripping water, or salt
Altitude	0~1000 meters。For every 1000 meters elevation, the output current capacity is reduced by 10%.
Ambient temperature	Operating temperature range: -10℃~ +40℃（Note: For temperatures between +40℃~ +50℃, the rated capacity should be reduced by 2% for each additional degree above +40℃）. Customized solutions are available for non-standard temperature ranges from-20℃~ +50℃. Storage temperature: -25℃~ +60℃
Humidity	Below 95%, no droplet condensation
vibration	< 6m/s^2
Levels of protection	IP20，fully customizable IP54 solution across the full power spectrum

Key technical indicators

Power factor	⩾0.92
Overall efficiency	⩾97%
Grid-side current harmonic distortion rate (THDi)	⩽35%
	⩽5% or ⩽10% (optional APF)

Note: The above technical parameters are measured at 100% load after the inverter is equipped with either an AC input reactor or a DC reactor.

Naming rules

TS6000 – 4 T 2500 – GX

Product serial number

Voltage level

4	380V

Power phase number

T	three phase

Other special codes

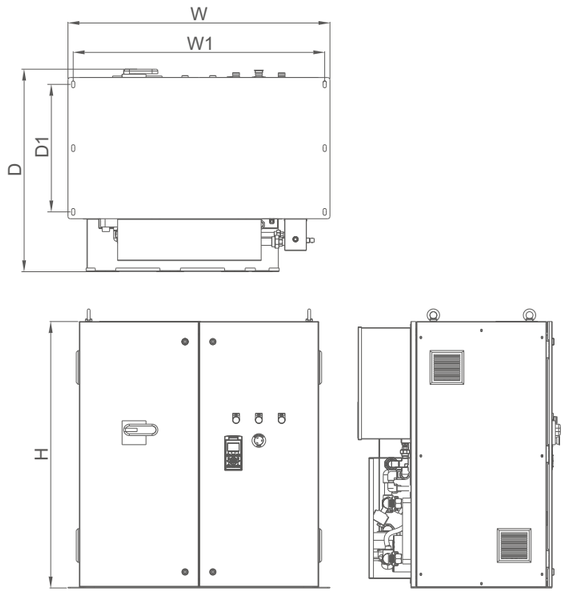
Power level (kW)

2000	200
2200	220
⋮	⋮
8500	850
9000	900

Model table

Model No.	Centrifuge and other loads		
	Rated current (A)	Long term operational current (A)	Adapted motor (kW)
TS6000–4T2000	385	424	200
TS6000–4T2200	420	462	220
TS6000–4T2500	475	522	250
TS6000–4T2800	535	588	280
TS6000–4T3150	600	655	315
TS6000–4T3500	650	726	350
TS6000 –4T4000	730	820	400
TS6000 –4T4500	800	908	450
TS6000 –4T5000	900	1006	500
TS6000 –4T5600	1000	1155	560
TS6000 –4T6300	1120	1276	650
TS6000 –4T7000	1250	1386	710
TS6000 –4T8000	1430	1595	800
TS6000 –4T8500	1510	1661	850
TS6000 –4T9000	1600	1760	900
TS6000 –4T10000	1800	1980	1000

Installation size



Model No. (Three-phase 380V)	W (mm)	W1 (mm)	D (mm)	D1 (mm)	H (mm)	Screw specification
TS6000–4T2000	1099	960	699	380	850	M12
TS6000–4T2200						
TS6000–4T2500						
TS6000–4T2800						
TS6000–4T3150						
TS6000–4T3500						
TS6000 –4T4000	1374	1104	1016	560	1170	M12
TS6000 –4T4500						
TS6000 –4T5000						
TS6000 –4T5600						
TS6000 –4T6300						
TS6000 –4T7000	1487	1230	1083	650	1254	M12
TS6000 –4T8000						
TS6000 –4T8500						
TS6000 –4T9000	1503	1302	1101	650	1258	M12
TS6000 –4T10000						