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**Service Network**  
Website: **www.savch.net**  
**Qualification**  
Received **ISO9001** and **CE** recognition

[WWW.SAVCH.NET](http://WWW.SAVCH.NET)

Industry intelligence • Energy saving • Green power

## CHAPTER ONE

### Company Profile

Savch Electric Co., Ltd was set up in Quanzhou, Fujian province in 2001 and established a research and development center in Shanghai. It is one of the first few companies to develop and produce motor drives in China. In 2005, it became China's top ten inverter brands. The company relies on a strong R & D team and world-class power electronics production and quality control system (OEM for top international brand) to provide customers with high-performance servo drives, inverters, computer controllers and other industrial control products.

The company focuses on the frontier technology fields of "industrial intelligence, energy saving, green energy", and adheres to the core goal of "creating value for customers", and establishes a technical R&D team that highly conforms to customer industry characteristics and highly integrated mechatronics and provide more efficient and resource-efficient system solutions for various industries customers. For the pass years, the company has established a global equal and close cooperation agent system, and customer service system with user satisfaction as an indicator, widely used in ceramics, packaging, textile, dyeing and finishing, engineering upgrading, lifting, road, CNC machine tools, glass, mining, petroleum, shipbuilding, military and even farming and animal husbandry and other equipment fields.

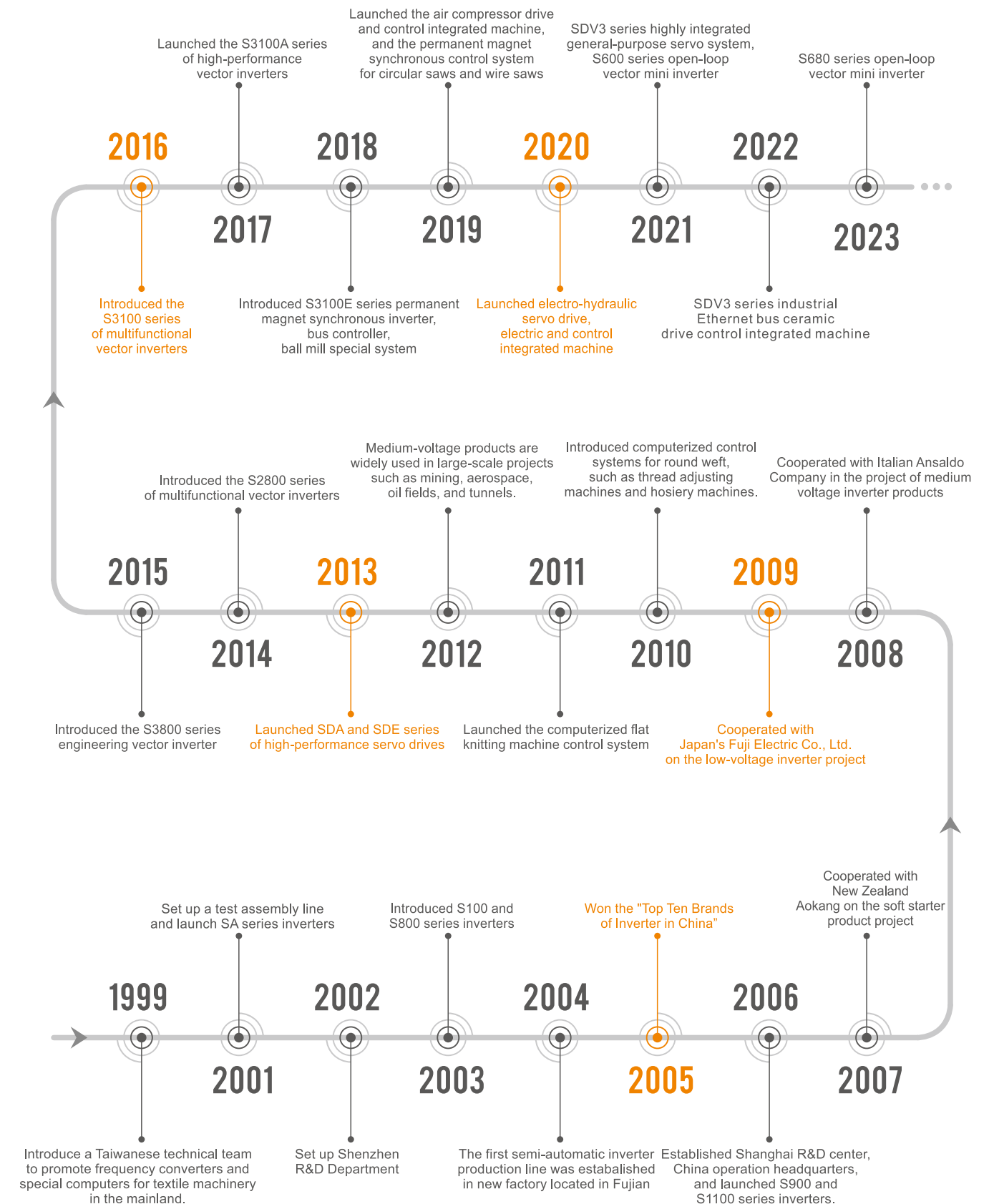


Office buildings and dormitories

## CHAPTER TWO

### Development

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## CHAPTER THREE

### Production



#### ► SMT production

Fuji XPF fully automatic SMT production line, the one-time through rate of production can reach 99.5%.



#### ► Product assembly

Taiwan semi-automated assembly line, ATE automated test system.



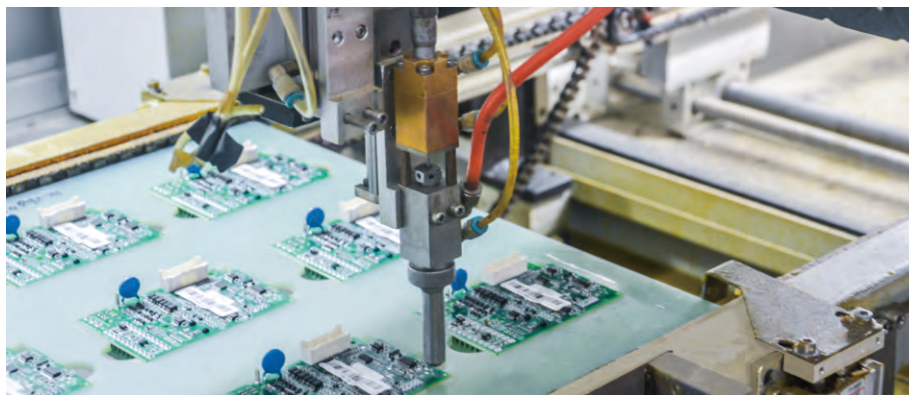
#### ► Three- proof coating

Using British Elctrolube environmentally friendly insulating three-proof coating visualized automatic spraying protection, insulation, dustproof, moisture-proof and anti-corrosion. Protect circuit boards and components from environmental erosion, ensure long-term stable operation of products, and extend service life.



#### ► Finished product test

On-load testing of products, combined with SAVCH MES to record product files, to achieve effective traceability.



#### ► Finished product aging

The new product is 100% aging, and the output reaches more than 5,000 units with 30% aging, verifying product stability.

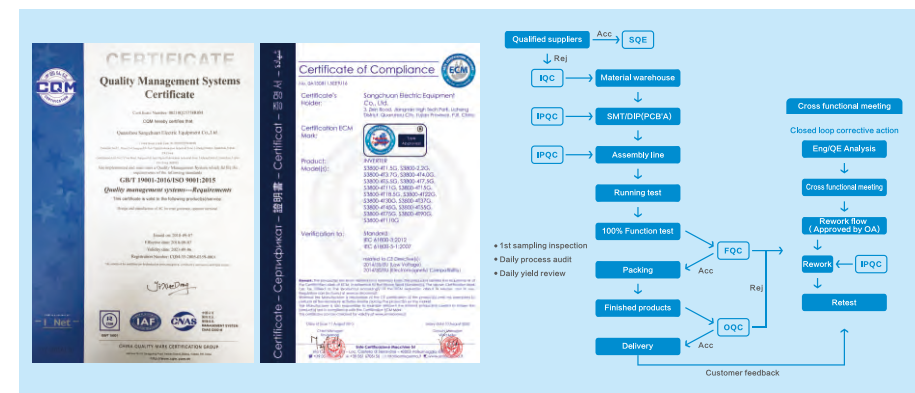
#### ► Aging conditions

Temperature standard  $55\pm5^{\circ}\text{C}$   
Operating frequency 50Hz  
Time standard 12 hours



#### ► Semi-finished product testing

100% semi-finished product testing to ensure that the pass rate of finished product assembly is over 98.5%.



#### ► Quality certification

ISO quality system certification and internal quality control process.

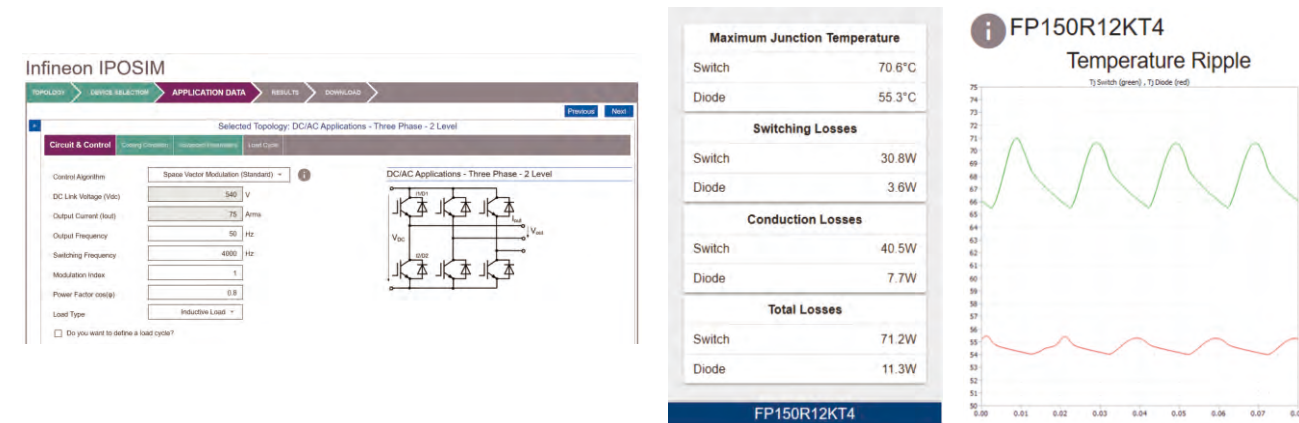


## CHAPTER FOUR

### Quality

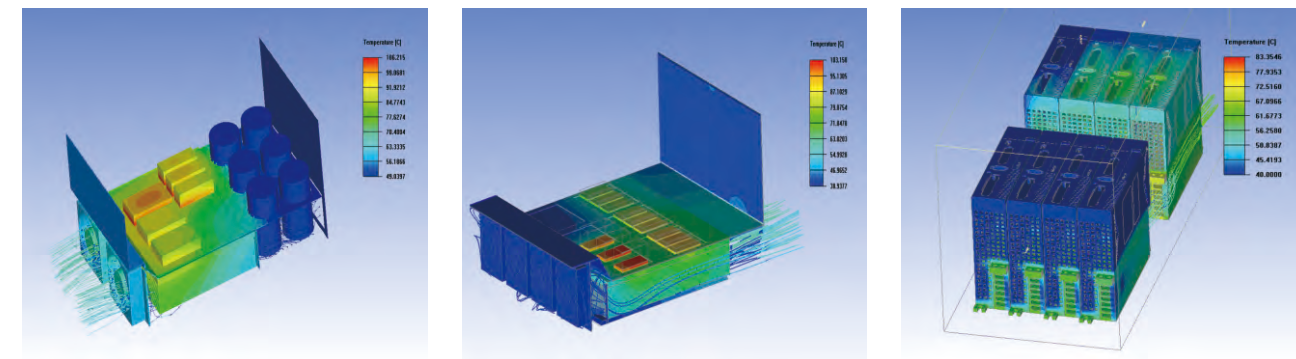
#### Device Simulation

Power device selection and simulation, adopt German Infineon IGBT, simulate actual working parameters, simulate IGBT, calculate switching loss, conduction loss and thermal performance.



#### Thermal Simulation

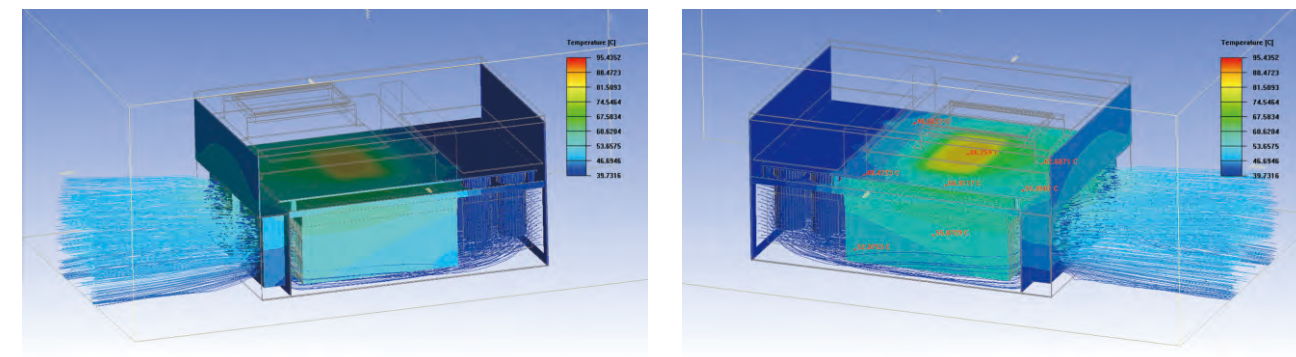
Thermal design and thermal simulation, using workstation modeling, supplemented by industry-leading thermal simulation software calculations, provide a comprehensive and systematic heat dissipation design for the product.



110kW inverter

500kW inverter

750W servo



Independent air duct design

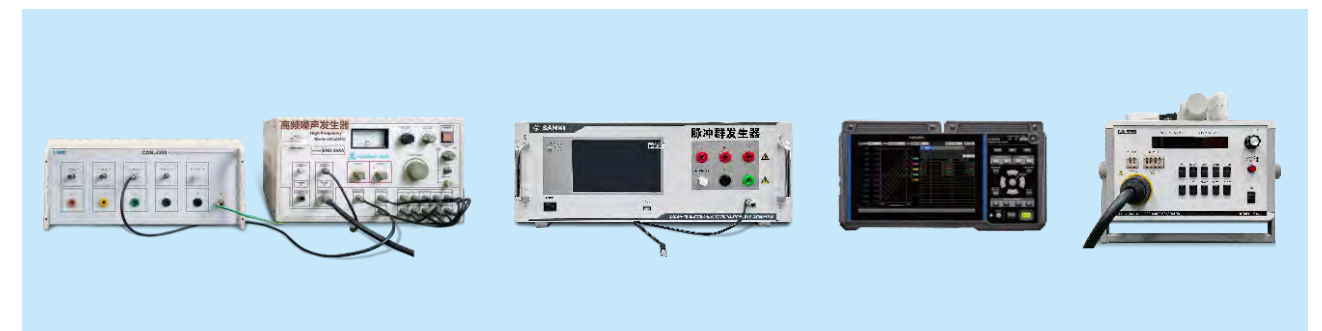
#### Performance Experiment



Permanent magnet & asynchronous motor torque towing test bench

45~1000kW energy feedback loading platform

#### Electromagnetic Compatibility Experiment and Environmental Experiment



High frequency noise generator

Pulse group generator

Data acquisition instrument

Electrostatic discharge generator



Power analyzer

Vibration testing machine

Lightning surge generator

Low temperature alternating damp

Heat test box cold and heat shock test machine

#### Life Test



Salt spray testing machine

Life test bench remote APP control end

Life test bench

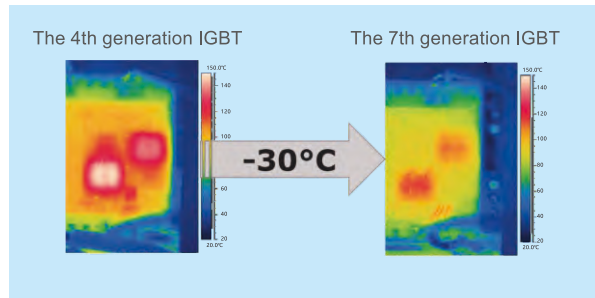


## Strengthen the Design



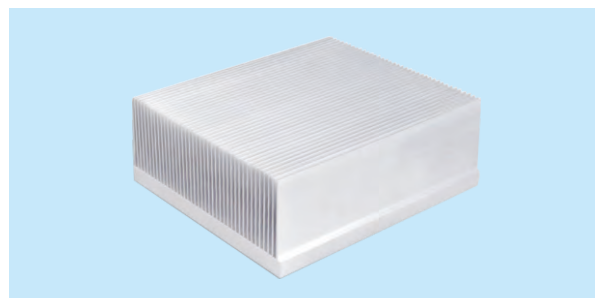
### ► Strengthen anti-vibration design

The circuit board adopts multiple damping measures such as multi-point support columns, rubber cushions, and glued fixing of components, and is widely used in various high-vibration industries such as punching machines.



### ► The seventh generation IGBT

German Infineon's latest generation IGBT has high junction temperature, low loss, 30% reduction in harmonics and 20% reduction in heat generation.



### ► High-density gear integrated stretch radiator

The thermal resistance of the heat sink substrate and the heat sink is stable and the thermal resistance is extremely small, supplemented by a high-speed DC cooling fan, which can provide higher heat dissipation efficiency under severe working conditions.



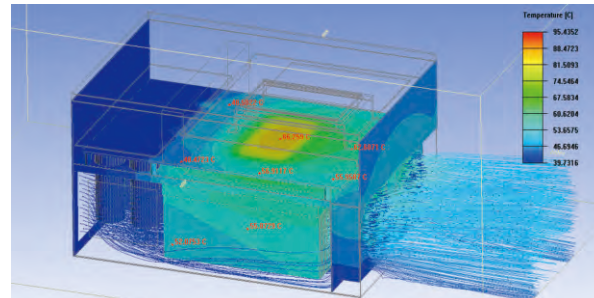
### ► Salt spray test

The 48-hour neutral salt spray test is verified, which can greatly extend the service life of the product in harsh environments.



### ► Wide voltage range

The shock-resistant rectifier module is used to increase the capacitance of the main circuit, which can withstand the impact of large current when low voltage is input, and keep the output voltage smooth.



### ► Independent air duct heat dissipation design

Effectively prevent dust from entering the inverter, improve the heat dissipation efficiency, reduce the temperature rise of the inverter, and ensure the reliable and stable operation of the inverter.



### ► BUSBAR integrated composite copper bar

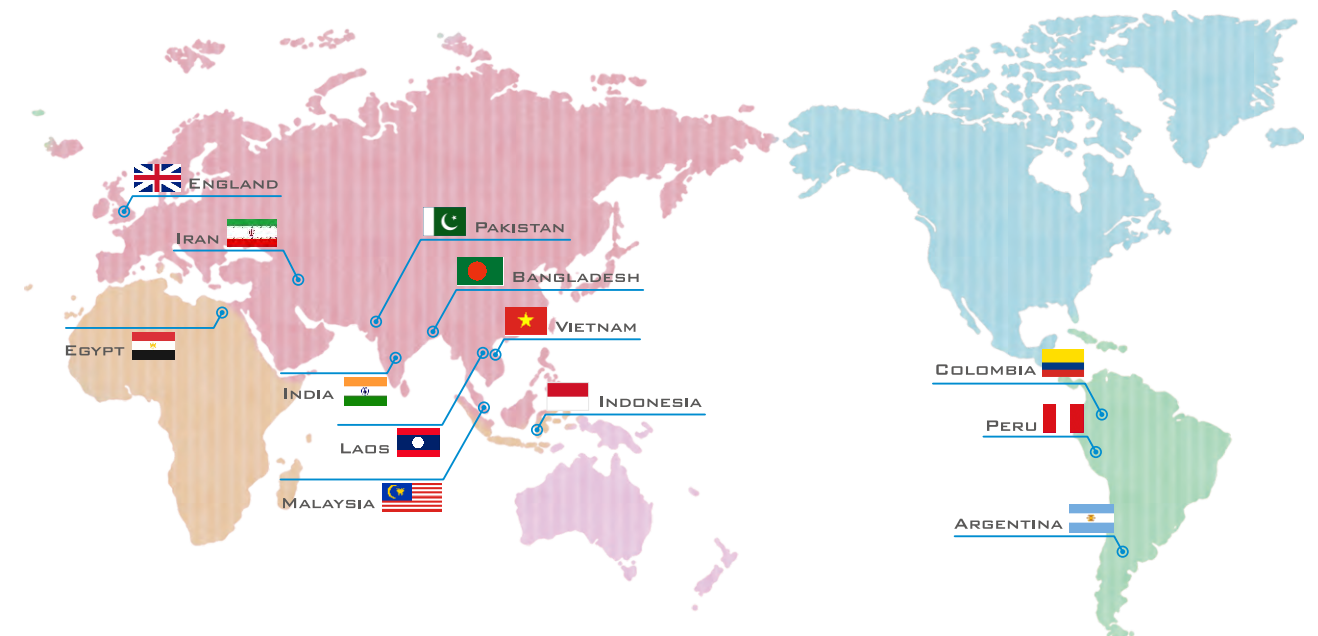
Very low impedance and voltage drop, uniformly distributed capacitance, reduce electromagnetic interference and radio frequency interference, reduce the damage of voltage spikes to IGBT, and extend the service life of the product.



### ► IP67 cooling fan

Ensure that the product can work stably for a long time in harsh working environments such as dust, high temperature and humidity, and corrosion, and provide high-efficiency heat dissipation.

## Overseas Service Network



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## CHAPTER FIVE

### Products

#### Motion Control (Servo System)

##### High Performance Purpose

###### SDA2 Series SDE2 Series



Rated Voltage: Single/three-phase 220V, three-phase 440V  
Frequency range: 0~250Hz  
Power range: 0.4 ~55kW

##### 【 Characteristics 】

- ▶ High performance
  - Response frequency up to 1.2kHz
  - Support 2500ppr, 17/20bit encoder
  - Max input/output pulse is 4Mpps
  - Low cogging torque
  - 3 times overload ability
  - Analog command resolution is 16bit (optional)
- ▶ Intelligent
  - Identification of Load Inertia
  - Automatic/Manual Notch filter
  - Real-time Automatic Gain Adjustment
  - Automatic/Manual Vibration Suppression control
- ▶ Practical
  - Friction Torque Compensation
  - Input/Output Signal Assigned
  - Gain switch
  - Torque limit change
  - Interrupt position control
  - Built-in Regeneration resistance
  - Gantry synchronization control
  - Electronic cam control
  - Dual PG full close- loop control
  - Motor and drive miniaturization
  - High flexibility internal location programming mode
  - Support CANopen, EtherCAT<sup>®</sup> to realize multi-axis high response synchronization control
- ▶ Safe
  - Safe torque off(STO) function(optional)
  - Apply to RoHS command to meet the environment protection requirement
  - Motor enclosure level is IP65/67 to meet the waterproof and dustproof requirement



##### General Purpose SDV3 Series



Rated Voltage: Single/three-phase 220V, three-phase 440V  
Frequency range: 0~250Hz  
Power range: 0.4~4.0kW

##### 【 Characteristics 】

- ▶ High performance
  - Response frequency up to 1.2kHz
  - Support 17/20bit encoder
  - Low cogging torque
  - 3 times overload ability
- ▶ Intelligent
  - Identification of Load Inertia
  - Automatic/Manual Notch filter
  - Real-time Automatic Gain Adjustment
  - Automatic/Manual Vibration Suppression control
- ▶ Practical
  - **Highly flexible script function**
  - Friction Torque Compensation
  - Input/Output Signal Assigned
  - Gain switch
  - Torque limit change
  - Interrupt position control
  - Motor and drive miniaturization
  - Internal position programming mode
  - Support CANopen, EtherCAT<sup>®</sup> to realize multi-axis high response synchronization control



#### Inverter

##### Open Loop Vector Mini Type (Asynchronous) S600 Series



Rated Voltage:  
Single/three-phase 220V, three-phase 440V  
Frequency range: 0.1~500Hz  
Power range: 0.4~5.5kW  
Control Modes: V/f, SVC (without speed sensor)

##### 【 Characteristics 】

- ▶ The optimal design of power density can effectively reduce the product volume.
- ▶ Support rail and screw installation methods.
- ▶ Independent air duct design can isolate dust to the greatest extent and ensure long-term stable operation of components.
- ▶ Optimized open-loop vector control algorithm, starting torque: 150%/1Hz, Overload capacity is 150%/60 seconds.
- ▶ 3-point V/f curve setting, V/f separation control.
- ▶ The function of instantaneous stop and non-stop, effective brake suppression.
- ▶ Built-in PID, simple PLC function, automatic torque compensation, automatic slip compensation.
- ▶ Support the extension keypad. Optional functions: 1 high-speed pulse input, 1 high-speed pulse output, 2 analog outputs, 1 extended relay output (2 channels in total).
- ▶ Provide a variety of fault protection functions: Inverter short-circuit protection, overvoltage, overcurrent, overload, overheat and other protection functions.



##### Open Loop Vector Mini Type (Permanent Magnet Synchronous) S600E Series



Rated Voltage: Single/three-phase 220V, three-phase 440V  
Frequency range: 0.1~500Hz  
Power range: 0.4~5.5kW  
Control Modes: V/f, SVC (without speed sensor)

##### 【 Characteristics 】

- ▶ The optimal design of power density can effectively reduce the product volume.
- ▶ Support rail and screw installation methods.
- ▶ Independent air duct design can isolate dust to the greatest extent and ensure long-term stable operation of components.
- ▶ Optimized open-loop vector control algorithm, starting torque: 150%/1Hz, Overload capacity is 150%/60 seconds.
- ▶ The latest high-performance vector control algorithm, permanent magnet synchronous start does not shake or reverse.
- ▶ The function of instantaneous stop and non-stop, effective brake suppression.
- ▶ Built-in PID, simple PLC function, automatic torque compensation, automatic slip compensation.
- ▶ Support the extension keypad. Optional functions: 1 high-speed pulse input, 1 high-speed pulse output, 2 analog outputs, 1 extended relay output (2 channels in total).
- ▶ Provide a variety of fault protection functions: Inverter short-circuit protection, overvoltage, overcurrent, overload, overheat and other protection functions.



##### General Mini Type (Asynchronous) S800 Series



Rated Voltage: Single-phase 220V  
Frequency range: 0.1~400Hz  
Power range: 0.2~0.75kW  
Control Modes: V/f (without speed sensor)

##### 【 Characteristics 】

- ▶ Overload capacity 150%-60s.
- ▶ Starting torque 150%-5Hz.
- ▶ Auto slip detection compensation, auto torque compensation, low noise.
- ▶ Intelligent wobble frequency, could be applied in the occasions that required traverse or winding, such textile and fiber chemical etc.
- ▶ With built-in RS485 port and support different protocols, such as RTU, ASCII and so on.
- ▶ Built-in PLC, available to preset 16 sections of running program.
- ▶ The extending keypad supports parameters copy.





## Multi Function Mini Type (Asynchronous) S900 Series



Rated Voltage: Single-phase 220V, three-phase 440V  
Frequency range: 0.1~400Hz  
Power range: 0.2~3.7kW  
Control Modes: V/f (without speed sensor)

### 【 Characteristics 】

- ▶ Overload capacity 150%-60s.
- ▶ Starting torque 150%-5Hz.
- ▶ Auto slip detection compensation, auto torque compensation, low noise.
- ▶ Intelligent wobble frequency, could be applied in the occasions that required traverse or winding, such textile and fiber chemical etc.
- ▶ With built-in RS485 port and support different protocols, such as RTU, ASCII and so on.
- ▶ Built-in PLC, available to preset 16 sections of running program.
- ▶ Mini body is permit to install side by side ( $T_a \leq 40^\circ\text{C}$ ).
- ▶ Support extending keypad. The terminal cover is flexible to open which is convenient to wiring.



## General Open Loop Vector Type (Permanent Magnet Synchronous) S3100E Series



Rated Voltage: Single/three-phase 220V, three-phase 440V  
Frequency range: 0.1~500Hz  
Power range: 0.4~500kW  
Control Modes: SVC (without speed sensor)

### 【 Characteristics 】

- ▶ The overload capacity is 150%-60 seconds for G type and 120%-60 seconds for P type.
- ▶ The maximum starting torque is 200%-0.5Hz.
- ▶ The latest high-performance vector control algorithm, permanent magnet synchronous start does not shake or reverse.
- ▶ The open loop vector speed is stable, and the speed stability accuracy is 0.1%.
- ▶ Built-in PID, simple PLC and other functions.
- ▶ Multi-channel multi-function terminal, 1 high-speed pulse input, 1 high-speed pulse output.
- ▶ The input and output terminals can be freely programmed, and the software can switch the high and low level acquisition modes.
- ▶ Automatic voltage stabilization function, when the grid voltage changes, the constant voltage output is automatically maintained.
- ▶ Protection functions include: Short-circuit protection, overvoltage, overcurrent, overload, and overheat protection.



## General Open Loop Vector Type (Asynchronous) S3100A Series



Rated Voltage: Single/three-phase 220V, three-phase 440V  
Frequency range: 0.1~3200Hz  
Power range: 0.4~630kW  
Control Modes: V/f, SVC (without speed sensor)

### 【 Characteristics 】

- ▶ The overload capacity is 150%-60 seconds for G type and 120%-60 seconds for P type.
- ▶ Maximum starting torque (SVC) 200%-0.5Hz.
- ▶ 3 points V/f curve setting, 6 groups of V/f curve setting, V/f separation control.
- ▶ Momentary stop and non-stop function, speed tracking function, effective brake suppression function.
- ▶ Built-in PID function, simple PLC function, swing frequency function.
- ▶ Multi-channel multi-function terminal, 1 high-speed pulse input, 1 high-speed pulse output.
- ▶ The input and output terminals can be freely programmed, and the software can switch the high and low level acquisition modes.
- ▶ Models with power of 37kW and below have built-in brake unit.
- ▶ Can be switched to high frequency (3200Hz) output.
- ▶ With dual rated specifications: G-type heavy-duty/P-type light-duty specifications can be set by parameters.
- ▶ Provide multiple fault protection functions: Inverter short-circuit protection, overvoltage, overcurrent, overload, overheat and other protection functions.



## Bluetooth Debugging Assistant

Savch Bluetooth debugging assistant, including two WeChat applets: SDV3 series servo driver and S600 series inverter. By connecting the driver through the Bluetooth module, the applet can easily manage and maintain the product.

### 【 Main Functions 】

- ▶ Online viewing of parameters
  - ▶ Batch downloading of parameters
  - ▶ Parameter file management
  - ▶ Driver data monitoring
  - ▶ Alarm monitoring
  - ▶ Convenient commissioning\*
  - ▶ Quick configuration of wiring guidance and IO function\*
  - ▶ Various convenient tools\*
  - ▶ Bluetooth connection
- (Function with \* is under development)



## All-in-One Machine

### Compressor AIO SACS Series

#### 【 Characteristics 】

- ▶ Integrate all electronic control parts, including high-performance permanent magnet drive, pressure sensor collection and automatic PID constant pressure control, loading valve switch control, fan control and phase sequence detection, two-way temperature sensor detection, emergency button, and external human-machine Touch screen HMI operation display.
- ▶ Reduce system wiring, improve air compressor assembly efficiency, reduce failure rate, and improve system stability.



### Ball Mill AIO

#### 【 Characteristics 】

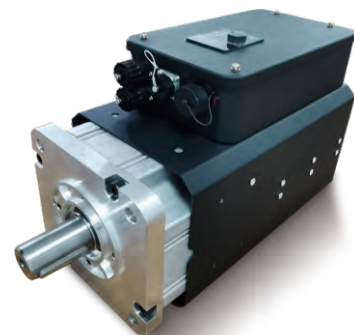
- ▶ Using frequency conversion adjustment technology and combining the working principle of the ball mill to transform the driving system of the ball mill.
- ▶ The frequency converter can be set to operate in different modes according to the process requirements of different raw materials to realize the continuous adjustment of the operating speed of the ball mill, low speed and large torque, and the characteristics of no impact when the motor starts, and can effectively control the feedback energy caused by the large inertia of the ball mill.
- ▶ It solves the shortcomings of the ball mill, such as difficulty in starting, large starting current, frequent mechanical damage, etc., so that the fluctuation of the power grid is small, and the life of the belt, shaft, and gearbox of the ball mill is increased.



### Knitting Machine AIO

#### 【 Characteristics 】

- ▶ Integrated machine with servo motor, drive and control for large circular knitting machine.
- ▶ 70N•m, 750rpm, improve fabric quality, save energy, reduce wiring, reduce electrical box, reduce assembly time, and reduce machine vibration.



### Electro-Hydraulic Servo AIO

#### 【 Characteristics 】

- ▶ Including the integration of gear pump, coupling, servo motor, driver and controller.

## Human Machine Interaction (HMI)

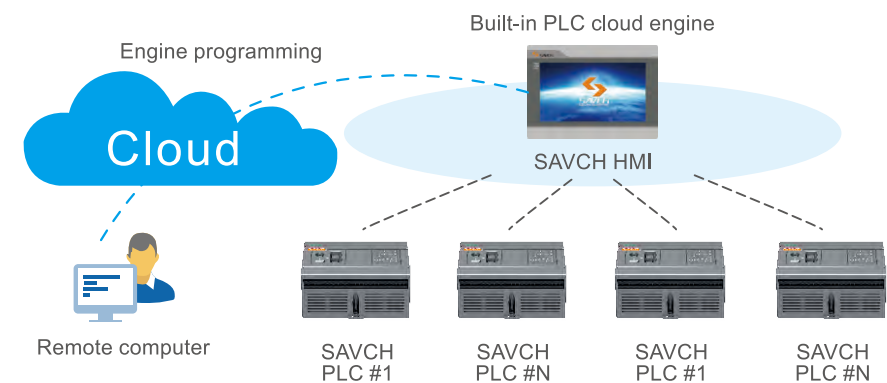
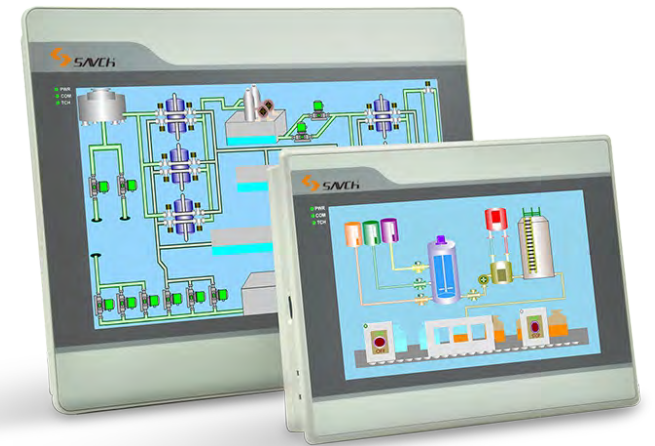
### General Touch Screen SPN Series



Size: 7 inches (Pixel 800×480)  
10.1 inches (Pixel 1024×600)  
Power supply: DC24V

#### 【 Characteristics 】

- ▶ Hardware configuration:
  - Cortex A8 800MHz CPU
  - 4GB Flash+512MB DDR3
  - 10M/100M Ethernet
  - USB-Host
  - Micro-SD
- ▶ Ports:
  - COM1 (RS232/RS485/RS422)
  - COM2 (RS232/RS485)
  - RJ-45
- ▶ Display characteristics:
  - Exquisite picture
  - Saturated color
  - LED backlight
- ▶ Project downloading:
  - Serial ports
  - USB disk
  - SD card
  - Ethernet port
- ▶ Special functions:
  - Multi-screen Networking
  - A/B Key security mechanism
  - LAN/ cloud / mobile terminal access control





## Control Technology (PLC)

### Bus type PLC

#### JH2 Series

##### 【 Characteristics 】

- ▶ Combination control of pulse and EtherCAT bus
- ▶ Plug and play bus without XML file
- ▶ 4-way AB phase input 200Khz, 8-axis high-speed output 200Khz
- ▶ Support Ethernet, RS232, RS485 multiple communication ports, supporting Modbus RTU/Ascii/Tcp communication protocol and free protocol
- ▶ Extensive expansion, digital quantity, analog quantity, weighing, temperature, etc
- ▶ Program encryption, upload is prohibited
- ▶ Ethernet program download
- ▶ USB interface program download, USB disk download, USB cable computer download



#### JE Series

##### 【 Characteristics 】

- ▶ Combination control of pulse and EtherCAT bus
- ▶ Plug and play bus without XML file
- ▶ 4-way AB phase input 200Khz, 8-axis high-speed output 200Khz
- ▶ Support Ethernet, RS232, RS485 multiple communication ports, supporting Modbus RTU/Ascii/Tcp communication protocol and free protocol
- ▶ Extensive expansion, digital quantity, analog quantity, weighing, temperature, etc
- ▶ Program encryption, upload is prohibitedress, backlash compensation,
- ▶ Ethernet program download
- ▶ USB interface program download, USB disk download, USB cable computer download



#### JT5 Series

##### 【 Characteristics 】

- ▶ Compact card type structure
- ▶ Combination control of pulse and EtherCAT bus
- ▶ Plug and play bus without XML file
- ▶ 4-way AB phase input 200Khz, 8-axis high-speed output 200Khz
- ▶ Support Ethernet, RS232, RS485 multiple communication ports, supporting Modbus RTU/Ascii/Tcp communication protocol and free protocol
- ▶ Extensive expansion, digital quantity, analog quantity, weighing, temperature, etc
- ▶ Program encryption, upload is prohibited
- ▶ Ethernet program download
- ▶ USB interface program download, USB disk download, USB cable computer download



### Profinet, EtherCAT bus type distributed I/O

##### 【 Characteristics 】

- ▶ Support Profinet/EtherCAT bus
- ▶ Compact card type structure
- ▶ Rich types, digital quantity, analog quantity, temperature, weighing, etc
- ▶ Spring type pluggable terminal, convenient for connection and maintenance



### Standard PLC

#### JH Series

##### 【 Characteristics 】

- ▶ 4-channel AB phase input 200kHz, 8-axis high-speed output 200kHz
- ▶ Support Ethernet, RS232, RS485 multiple communication ports, supporting Modbus RTU/Ascii/Tcp communication protocol and free protocol
- ▶ Extensive expansion, digital quantity, analog quantity, weighing, temperature, etc
- ▶ Program encryption, upload is prohibited
- ▶ Ethernet program download
- ▶ USB interface program download, USB disk download, USB cable computer download



#### JS Series

##### 【 Characteristics 】

- ▶ Max 12 axis step/servo pulse control
- ▶ Max 12 single-phase/6 differential high-speed counting
- ▶ Support Ethernet, RS232, RS485 multiple communication ports, supporting Modbus RTU/Ascii/Tcp communication protocol and free protocol
- ▶ Extensive expansion, digital quantity, analog quantity, weighing, temperature, etc
- ▶ Program encryption, upload is prohibited
- ▶ Ethernet program download
- ▶ USB interface program download, USB disk download, USB cable computer download

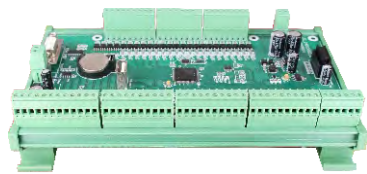


### Customized PLC

#### JC Series

##### 【 Characteristics 】

- ▶ Single board mode of module frame
- ▶ Max 24 axis step/servo pulse control
- ▶ Support RS232 and RS485 multiple communication ports, supporting Modbus RTU/ASCII communication protocol and free protocol
- ▶ Extensive expansion, digital quantity, analog quantity, weighing, temperature, etc
- ▶ Program encryption, upload is prohibited
- ▶ USB interface program download, USB disk download, USB cable computer download



### Compact PLC

#### JT Series

##### 【 Characteristics 】

- ▶ Compact card type structure
- ▶ Max 8 high-speed inputs and 8 high-speed outputs
- ▶ RS232 and RS485 multiple communication ports, supporting Modbus RTU/ASCII communication protocol and free protocol
- ▶ Extensive expansion, digital quantity, analog quantity, weighing, temperature, etc





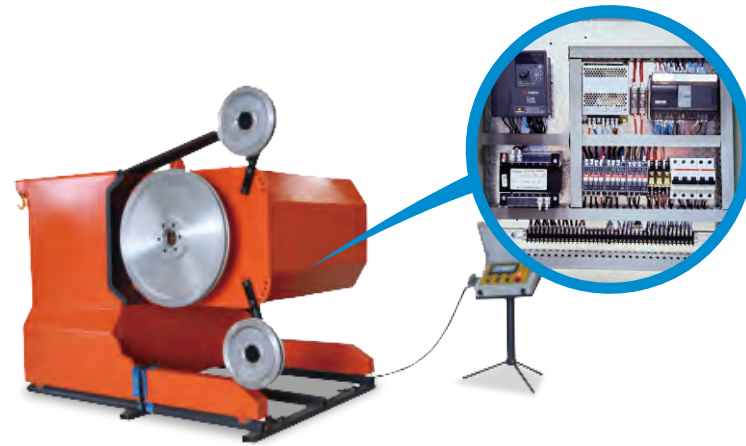
## CHAPTER SIX

### System Integration

#### The control system of the mountain wire saw

##### 【Characteristics】

- Using a SAVCH programmable controller, one piece of 55kW SAVCH permanent magnet synchronous inverter to drive the wire saw cutting and one piece of 1.5kW SAVCH inverter to drive asynchronous motor control equipment walking.



#### The control system of the mountain circular saw

##### 【Characteristics】

- Using 2 sets of 75kW SAVCH permanent magnet synchronous inverters to drive 2 sets of permanent magnet synchronous motors to drive the saw blade for cutting operations, and 1 set of 4kW SAVCH inverters to drive 1 asynchronous motor to coordinate with the equipment walking control.



#### Engraving machine control system

##### 【Characteristics】

- The engraving machine system adopts 6-10 sets of SAVCH servos, with fast speed, high precision, good stability, constant power frequency conversion spindle motor, high cutting force and high efficiency.



## CHAPTER SEVEN

### Industries Application

#### Oil production equipment



#### Green facilities



#### CNC equipment



#### Ceramic equipment



#### Medical equipment



#### Printing equipment



#### Food machinery



#### Plastic machinery



#### Stone machinery



#### Textile machinery



#### Package machinery



#### Conveying equipment

