SAVCH®
SAVCH ELECTRIC

S3100 Series Inverter
Multi Function Open-loop Vector Control (IM)

工业智能 节能 绿色电能

WWW.SAVCH.NET

Company Profile

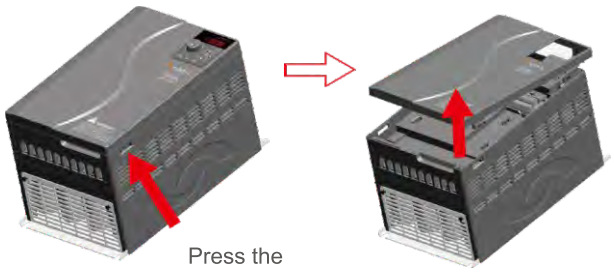
Savch Electric Co., Ltd was set up in Quanzhou, Fujian province in 2001 and established a research and development center in Shanghai. It is one of the first few companies to develop and produce motor drives in China. In 2005, it became China's top ten inverter brands. The company relies on a strong 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.

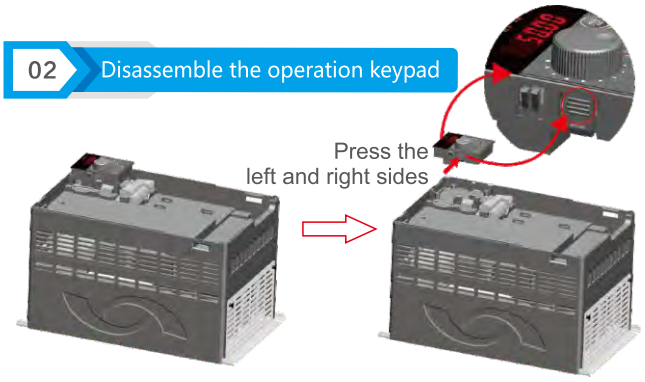
For More Convenient Maintenance

- Integrate into the easy disassembly modularization factor.
- The maintenance is easier and it is convenient to sink heat and clean internal.

01 Disassemble the mainframe cover



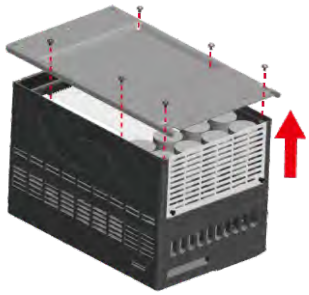
02 Disassemble the operation keypad



03 Disassemble the capacitor baffle

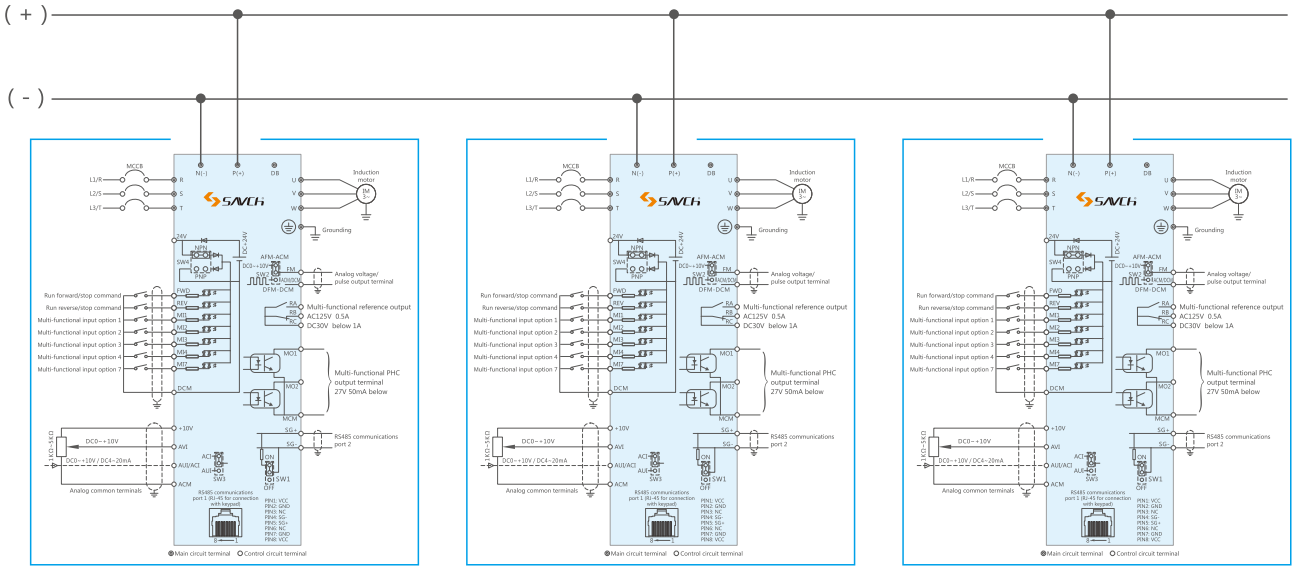
04 Disassemble the fan

05 Disassemble the baseboard



Common DC Bus

- All the power range support the common DC bus application, to share with the energe, and reduce the braking resistor power or cancel the brake resistor.



More Comprehensive Protection

- More optimized module temperature management. If the temperature of environment is high or over loading, it can protect more timely and considerately.
- More optimized short-circuit protection.
- 220V with power range below 4.0kW and 440V with power range below 5.5kW is built in with charging resistor overheat protection unit (for other power range, it is optional).

More Flexible Operation

- External input terminal can select the two working modes, NPN, PNP to connect with external PLC and touch screen neatly.

Characteristics

- High start torque, available to achieve 150% of torque output on low speed 1.0Hz.
- Control method: V/f control, dynamic torque vector control.
- Support many frequency setting methods: digital setting, analog quantity setting, pulse setting, PID setting, communication setting etc.
- 16 sections, multi-velocity control and PID control.
- Support DC braking of stop and external terminal control DC braking.
- With overtorque detection.
- With auto voltage adjustment. The output voltage would be stabilized automatically when the grid voltage varies.
- With jump frequency control, make the system stabler and more reliable on mechanic resonance.
- The input and output terminal are auto-program, user could make many working modes according to the needs.
- Attached with many fault protection functions: converter unit protection, overvoltage protection, overcurrent protection, overload protection, overheat pretection etc.

Various Application

- S3100 series is new generation, Multi-function, Vector control inverters.
- It could widely applied on the fields that have high requirements on the speed control accuracy, torque response speed, low frequency output performance.

Function Description

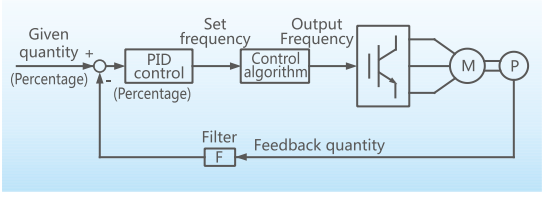
- Multi terminal ports:

AVI	DC 0~+10V input
AUI/ACI	DC 0~+10V/DC 4~20mA

FM	analog output AFM/ pulse output DFM
MI7	pulse input

- Plentiful application/protection:
  - Curve V/f pattern3 points
  - Analog fault output
  - With the function to select another motor
  - With "S" acceleration and deceleration pattern for selection
  - Check PID cable break or not
  - Droop control can be applied multi motors to synchronous transmission
  - Data change can be checked
  - Monitor the operating station
  - I/O check
  - Maintenance information can be checked
  - Alarm information can be cheched
- Enriched PID control:

  The PID regulator is used for temperature, pressure, and flow control, and adds functions such as deviation alarm and absolute value alarm output. The PID output limiter and the integral hold/reset signal make the PID control function more substantial and easier to use. When the PID regulator is used for the floating roller type tension control, the PID output limiter and the integral hold/reset signal can be used and show its advantages.

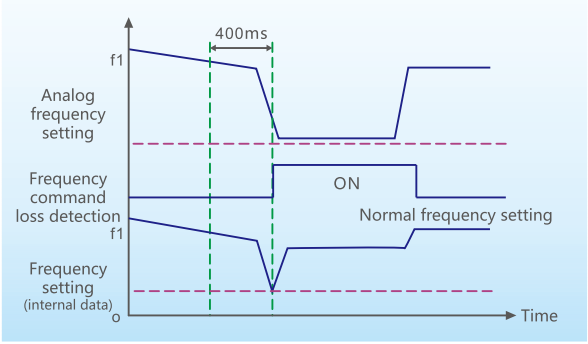


- Brake signal function:

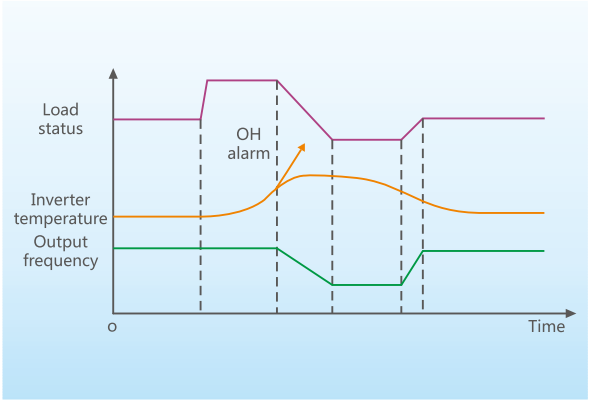
  When the brake is released, after the motor is operated, the torque is detected and the signal is output.

  When the brake is put into operation, the brake is applied in time to reduce the wear of the mechanical brake.

- Command loss detection:
  The frequency signal (0~10V, 4~20mA, multi-speed running signal, communication signal, etc.) is blocked due to mechanical vibration of the device, or poor circuit contact, disconnection, etc., and the command disappears. At this time, the inverter output command loss signal, using the detection command loss function, can pre-set the inverter output frequency when the command is lost, effectively preventing the motor from continuing to operate when the signal is blocked.

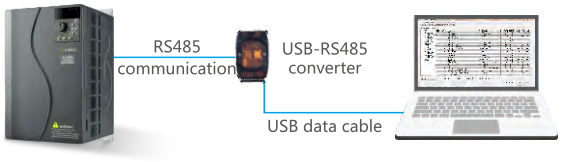


- Overload avoidance:
  If the foreign matter enters the fan or the pulley, it will cause the load to increase, the internal temperature of the inverter rises sharply, or the ambient temperature rises sharply, etc., causing the inverter to be in an overload state. The overload function can be avoided to reduce the motor speed and ensure that it is not stop running continuously.



- Support LCD and computer host computer:
  - In the optional accessories, we have prepared a multi-function operation keypad (extended use) for you, a large-backlit LCD screen with high visibility. In addition, the LCD can display the operation guide, which is easy to read (Copy function).

  - You can download the Windows interface software from our website freely to easily set up and manage the function code.



  - Equipped with analog inverter output alarm information function, it can easily confirm and use the sequential operation status of peripheral devices and inverter in the control cabinet.

Operation Keypad

- Function Description

Keypad Potentiometer
When frequency source selects the keypadpotentiometer, it is used for giving and adjusting the frequency.

Indicator light
The operation control mode of control panel, data x10 relationship or sparkling indication of hexadecimal.

Indicator light
Indicates the running instruction status

Jog Key
Jog running

Current running parameter unit indication

LED Monitor
Available to display set frequency, output frequency, output current, parameter and faults

Programmable/Reset Key
For 1st level menu entry or exit and alarm reset

UP/DOWN Key
For data or function code regulation

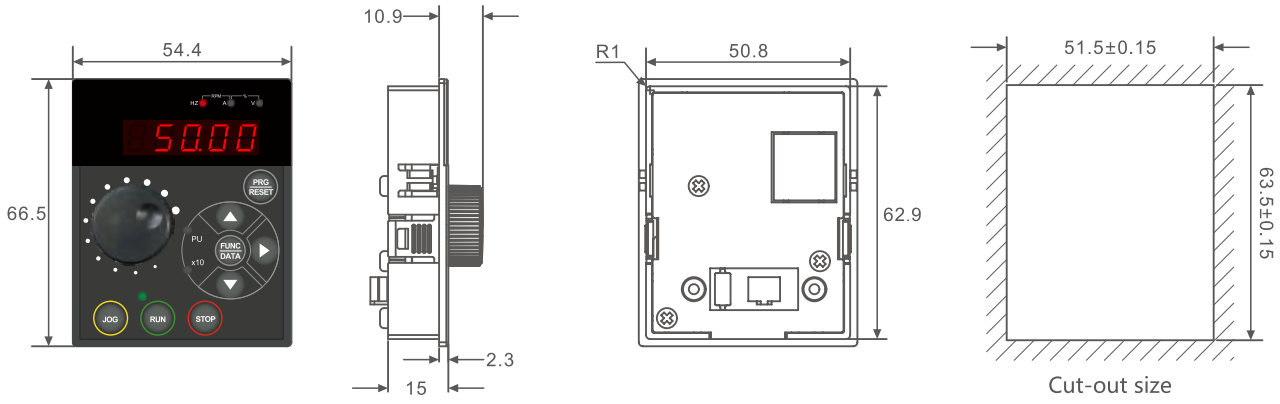
Right Move Key
Parameter bit shift

Function/Data Key
Cyclic switching of display parameter, and enter into menu step by step and setting parameter check

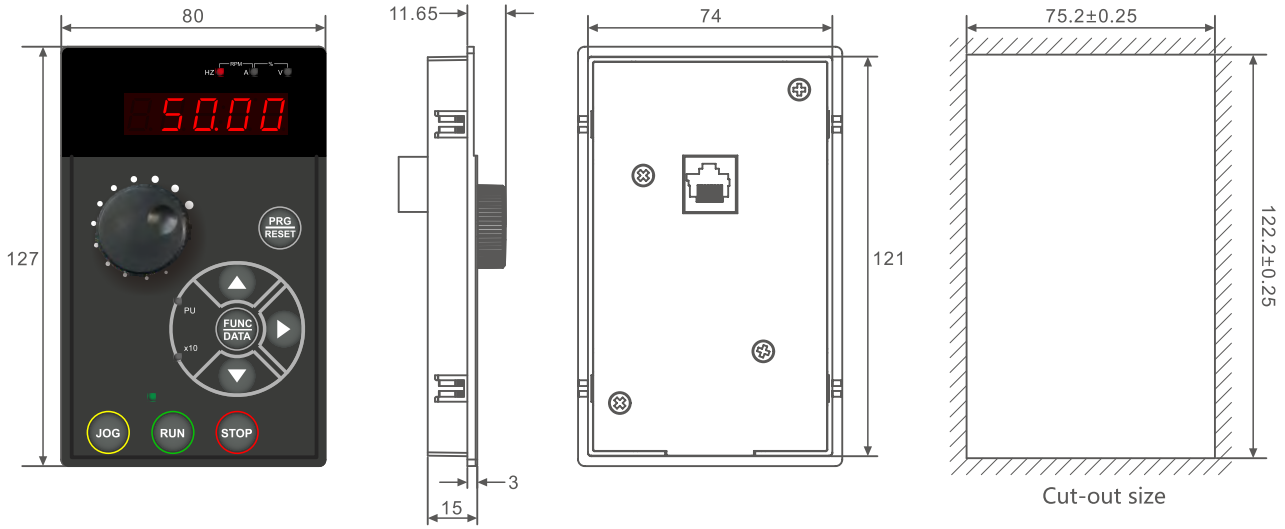
Running Key
Start running

Stop Key
Stop running

- Dimension
  - Below 18.5kW (include 18.5kW)



  - Above 22kW (include 22kW)



Note: the operation can extend by common cable (8 cores)

Model Description

S	3100	–	4T	7.5	G
SAVCH	Product series name		2T: 3 ph 220V (Note: 2T2.2G or below with compatibility of single phase) 4T: 3 ph 440V	0.4 : 0.4kW 0.75 : 0.75kW 1.5 : 1.5kW 2.2 : 2.2kW ⋮ 15 : 15kW ⋮ 500 : 500kW	G: General P: Light load

Product Specification

• Common specification

Item			Explanation
Output frequency	Setting range	Max. frequency	25 to 500Hz (changeable setting, Vector control maximum output frequency of 200Hz) (the maximum output frequency of high frequency dedicated type is 1000Hz)
		Base frequency	25 ~ 500Hz (changeable setting)
		Starting frequency	0.1 ~ 60.0Hz (changeable setting)
		Carrier frequency	0.75 ~ 12kHz Note:The carrier frequency may automatically drop depending upon the surrounding temperature or output current to protect the inverter. (The automatic drop function can be disabled)
	Setting resolution		• Keypad setting: 0.01Hz (99.99Hz or less), 0.1 Hz (100.0 to 500.0Hz) • Link operation setting: 1/20000 of maximum frequency or 0.01Hz (fixed)
Control	Control method		• V/f control • Dynamic torque vector control
	Voltage/frequency characteristics		• Possible to set output voltage at base frequency and at maximum frequency • AVR control ON/OFF selectable. Non-linear V/f pattern with three arbitrary points
	Torque boost		• Auto torque boost (for constant torque load) • Manual torque boost: Desired torque boost (0.0 to 20.0%) can be set • Select application load with function (Constant torque load or variable torque load)
	Starting torque		When the slip compensation and torque boost occurs, the torque can exceed 150%
	Start/stop operation		Keypad (RUN/STOP keys), external signals (run forward/run reverse, run/stop command etc.,), Communications link (RS485).
	Frequency Setting		• Keypad (Potentiometer adjustment, or by UP/DOWN button to set) • Analog input: DC0 to +10V/0 to +100% (terminal AVI, AUI) DC 4 to 20mA/0 to 100% (terminal AVI) • UP/DOWN operation: Multi-frequency (16 steps) • Pulse train input: Pulse input = MI7 terminal, Rotational direction = general terminals • Communication given • Reference frequency switching, Auxiliary frequency setting, and Inverse operation.
	Acceleration/ deceleration time		0.00 to 3600s, Linear/S-curve/curvilinear
	Stop control		• Running continued at the stop frequency, coast-to-stop, or force to stop • DC braking:Braking starting frequency (up to 60Hz), time (up to 30.0s), and operation level (up to 100%).
	Auto−restart after momentary power failur		• Alarm at power failure, alarm when power again • Restart at the frequency at which the power failure occurred, restart at the starting frequency
	Hardware current limiter		• Settable Current limiting action value • Over current limiting by hardware (it can be canceled)
	Torque limiter		• Torque limit value (200%) • Torque limiter 1/2, torque limiter enabled/disabled, analog torque limit value.
	Control functions		• Analog input adjustment (gain/offset/filter time constant), frequency limiter (high and low), bias frequency, jump frequency, 2nd, motor setting, universal DI, universal DO,universal AO, rotational direction limitation. • Overload prevention control, slip compensation, over voltage stall prevention,droop control, PID process control, PID dancer control, auto energy saving function. • Auto-tuning (Operating modes: motor load, do not connect the mechanical transmission parts) • Fault restart, command loss detection.
	Digital input		Run/stop forward and reverse command, select multi-frequency, select ACC/DEC time, Enable 3-wire operation, Coast-to-stop command,reset alarm, enable external alarm trip, ready for jogging, select frequency command 2/1, select motor, enable DC braking, select torque limiter level, UP/DOWN command, enable data change with keypad, cancel PID control, switch normal/inverse operation, universal DI, force to stop, reset PID integral and differential components, hold PID integral component, pulse train input, pulse train sign, select droop control.
	Transistor output		Inverter running, frequency arrival signal, frequency detected, under voltage detected (inverter stopped), inverter output limiting, auto-restarting after momentary power failure, motor overload early warning, keypad operation, inverter ready to run, inverter output limiting with delay, auto-resetting, universal DO, heat sink overheat early warning, reference loss detected, inverter operating, overload prevention control, current detected, PID alarm, Motor switch, brake signal, alarm relay contact output (for any fault)
	Analog output		• AFM: output a selected signal with DC voltage (0 to +10V) • DFM: output the selected signal by the way of pulse (the pulse of the highest frequency is 25~6000p/s). (FM terminal switches AFM/DFM by onnecting)

- Common specification (continue)

Item		Explanation
Control	Analog output	Output frequency (before slip compensation, after slip compensation), output current, output voltage, output torque, load factor, input power, PID feedback amount, DC link bus voltage, universal AO, motor output, PID command , PID output.
Indication	Running/ stopping	Speed monitor (reference frequency (Hz), output frequency, motor speed, load shaft speed). Output current, output voltage, torque calculation value, input power, PID command value, PID feedback amount, PID output, load factor, motor output
	Alarm information	Alarm history: Saves and displays the last 4 alarm code and their detailed description
Others	Communications	RS485 COM port 1 (for keypad connection), RS485 COM port 2 (on terminal block)
	Protection against momentary power failure	Upon detection of a momentary power failure lasting more than 15 ms, this function stops the inverter output. If restart after momentary power failure is selected, this function invoke a restart process if power is restored within a predetermined period (allowable momentary power failure time).

- Standard Specification
  - 220V single phase/three phase series

Item			Specifications						
Type(S3100-2T***G)(*1)			0.4	0.75	1.5	2.2	4.0	5.5	7.5
Nominal applied motor [kW](rated output)			0.4	0.75	1.5	2.2	3.7	5.5	7.5
Rated output	Rated power[kVA](*2)		1.1	1.9	3.0	4.1	6.4	9.5	12
	Voltage [V]		3 ph 200～240V (With AVR function)						
	Rated current [A]		3	5	8	11	17	25	33
	Overload capability		150%-1min						
Input power	Voltage, frequency		200～240V , 50Hz/60Hz						
	Voltage, frequency variations		Voltage: ±10% (Interphase unbalance rate is within 2%, frequency: +5~-5%)						
	rated input current [A]	three phase	3.1	5.3	9.5	13.2	22.2	31.5	42.7
		single phase	5.4	9.7	16.4	24.8	Single phase input is not supported		
Braking	Braking transistor		Standard built-in						
Enclosure			IP20 closed type						
Cooling method			Fan cooling						

(*1) 2T2.2G and below the power can be compatible single, select any two power as input terminal.

(*2) Rated capacity is calculated by assuming the output rated voltage as 220V.

■ 440V three phase series

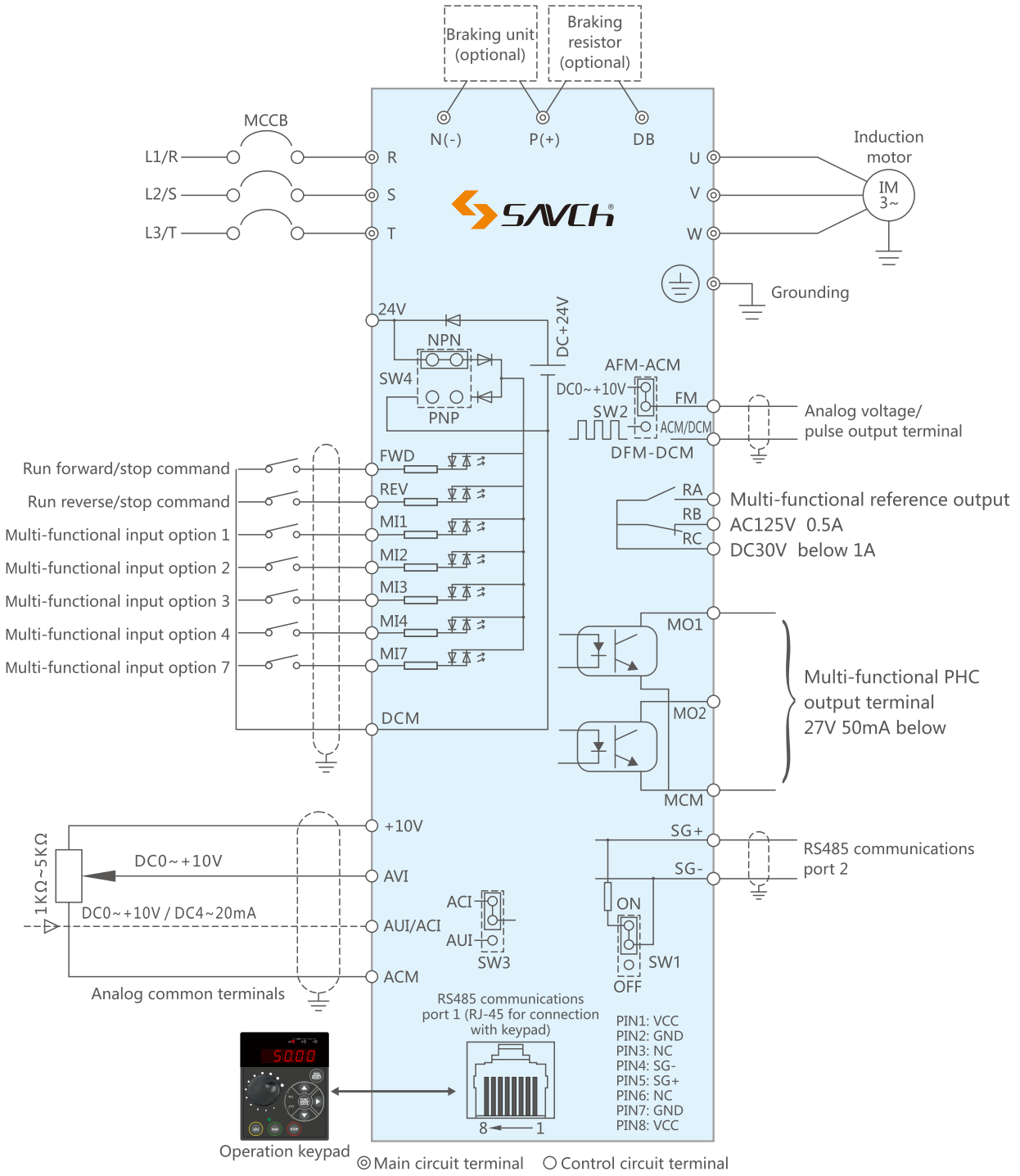
Item		Specifications												
Type (S3100–4T***G/P)		0.75	1.5	2.2	4.0	5.5	7.5	11	15	18.5	22	30	37	45
Nominal applied motor [kW](rated output)		0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45
Rated output	Rated power[kVA](*1)	1.9	2.8	4.1	6.8	9.9	13	18	22	29	34	45	57	69
	Voltage [V]	3 ph 380~460V (With AVR function)												
	Rated current [A](*4)	2.5 (3.2)	3.7 (4.7)	5.5 (6.5)	9.0 (11.8)	13 (15.0)	18 (21.7)	24 (28.5)	30 (35.4)	39 (45)	45 (60)	60 (75)	75 (91)	91 (112)
	Overload capability(*4)	G Specifications: 150%-1min (P Specifications: 120%-1min)												
Input power	Voltage, frequency	380～460V, 50Hz/60Hz												
	Voltage, frequency variations	Voltage: ±10% (Interphase unbalance rate is within 2%, frequency:+5~-5%)												
	Required power supply capacity (with DCR) [kVA](*2)	—										40	48	58
	Rated input current (with DCR)[A]	3.1	5.9	8.2	13	17.3	23.2	33	43.8	52.3	60.6	—		
	Rated input current (with DCR)[A]	—										62	76	90
Braking transistor		Standard built-in												—
DC reactor (DCR)		—										Model customization		
Enclosure		IP20 closed type										IP00		
Cooling method		Fan cooling												

Item		Specifications												
Type (S3100–4T***G/P)		55	75	90	110	132	160	200	220	280	315	355	400	500
Nominal applied motor [kW](rated output)		55	75	90	110	132	160	200	220	280	315	355	400	500
Rated output	Rated power[kVA](*1)	85	114	134	160	192	231	287	316	396	445	495	563	741
	Voltage [V]	3 ph 380~460V (With AVR function)												
	Rated current [A](*4)	112 (150)	150 (176)	176 (210)	210 (253)	253 (304)	304 (377)	377 (415)	415 (520)	520 (585)	585 (650)	650 (740)	740 (820)	880
	Overload capability(*4)	G Specifications: 150%-1min (P Specifications: 120%-1min)												
Input power	Voltage, frequency	380～460V, 50Hz/60Hz												
	Voltage, frequency variations	Voltage: ±10% (Interphase unbalance rate is within 2%, frequency:+5~-5%)												
	Required power supply capacity (with DCR) [kVA](*2)	71	96	114	140	165	199	248	271	347	388	436	489	611
	Rated input current (with DCR)[A]	—												
	Rated input current (with DCR)[A]	105	140	160	210	240	290	370	410	500	559	665	785	860
Braking transistor		—												
DC reactor (DCR)		Model customization			Optional (*3)									
Enclosure		IP00												
Cooling method		Fan cooling												

(*1) Rated capacity is calculated by assuming the output rated voltage as 440V.
(*2) Obtained when a DC reactor (DCR) is used.
(*3) DC reactor (DCR) is optional part, inverter of 110KW or above must use together with the DC reactor (DCR).
(*4) Brackets "(****)" in the table is the content for the P-type machine rated current and overload capacity.

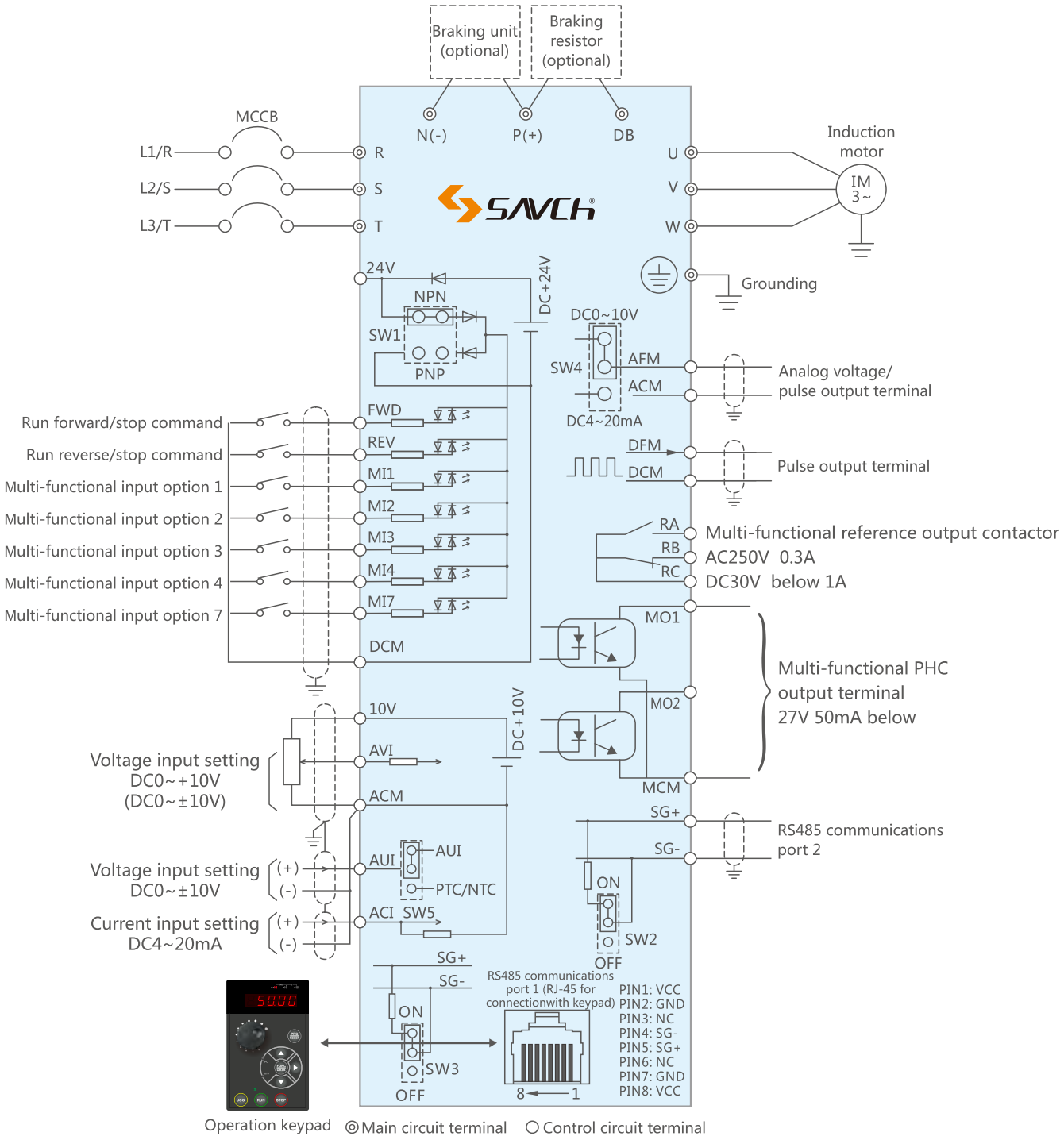
Basic Wiring Diagram

- Below 18.5kW (include 18.5kW)



Note: When the communication port 1 of RS485 has not connected with operator, it can communicate with PC.

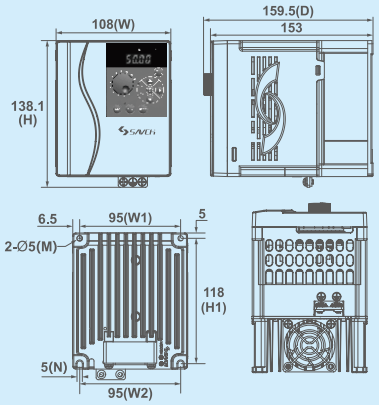
• Above 22kW (include 22kW)



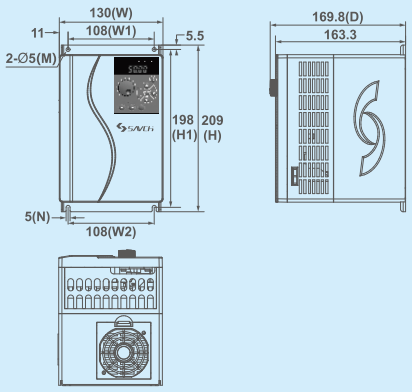
(Note 1) Remove the shorting chip between terminal P1 - P(+) before connecting if it's used to connect DC reactor (DCR) (accessories). Inverter of 110KW or above must use DC reactor (DCR).
(Note 2) In the inverter below 22kW built-in with brake unit. Make sure to remove the connection to the built-in braking unit when connecting external braking resistor (accessories).Please must select modes according to user manual.
(Note 3) When the communication port 1 of RS485 has not connected with operator, it can communicate with PC.

External Dimensions

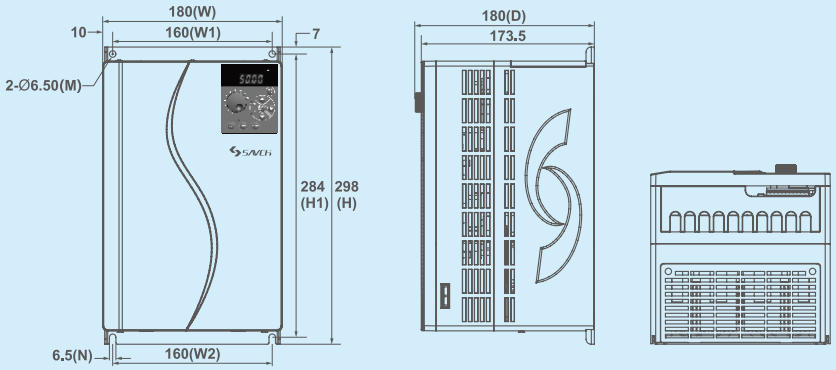
- External Dimensions of inverter (Unit: mm)



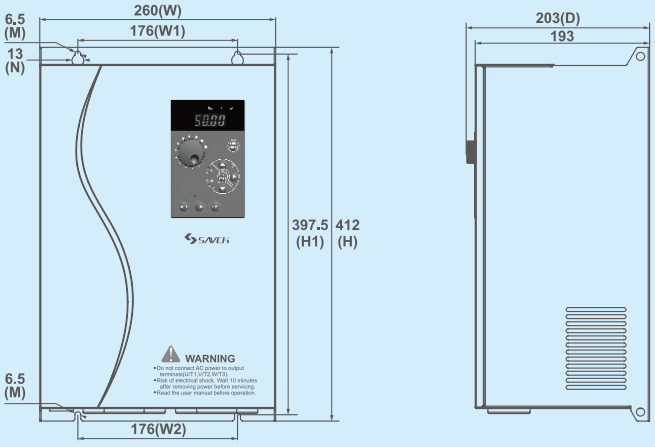
Size 1	2T	0.4G~1.5G
	4T	0.75G/1.5P~2.2G/4.0P



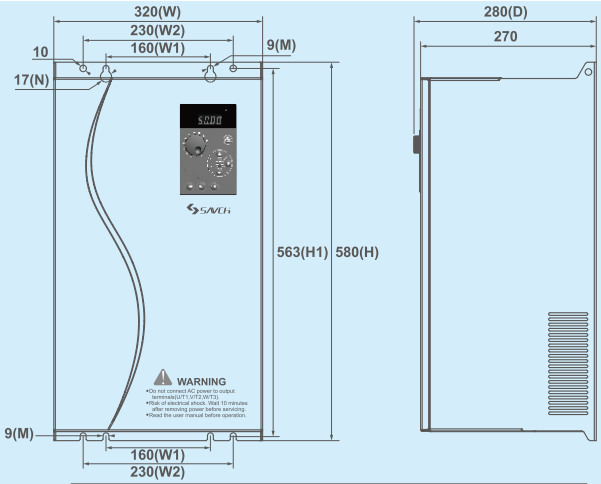
Size 2	2T	2.2G~4.0G
	4T	4.0G/5.5P~5.5G/7.5P



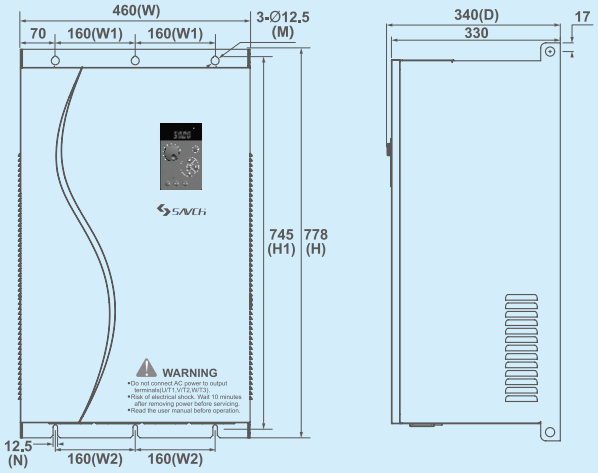
Size 3	2T	5.5G~7.5G
	4T	7.5G/11P~18.5G/22P



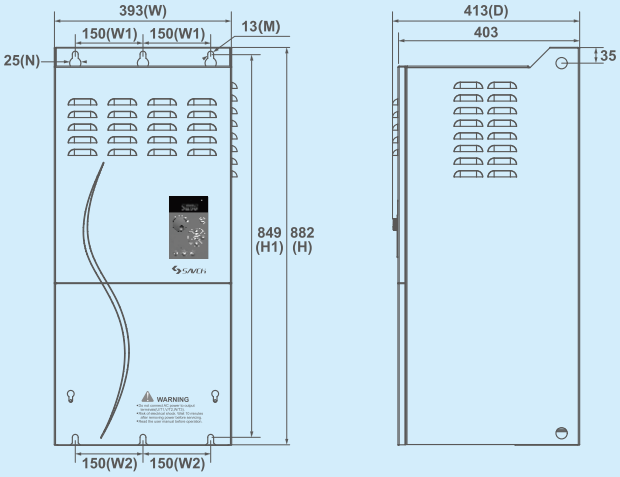
Size 4	4T	22G/30P~37G/45P



Size 5	4T	45G/55P~110G

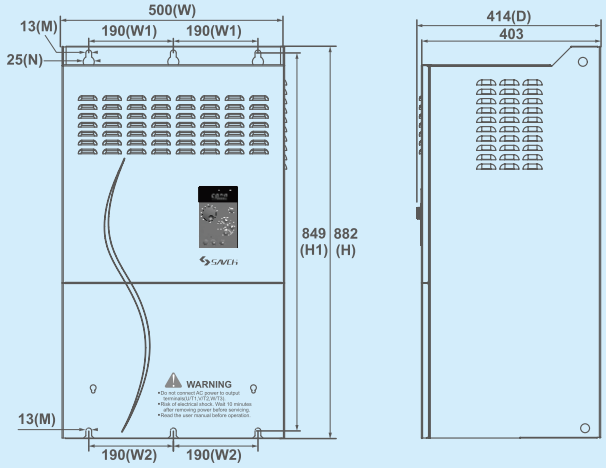


Size 6	4T	110G/132P~160G/200P

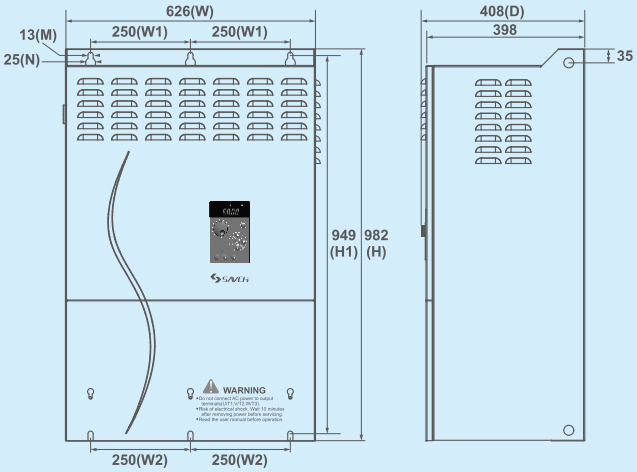


Size 7	4T	200G/220P~220G

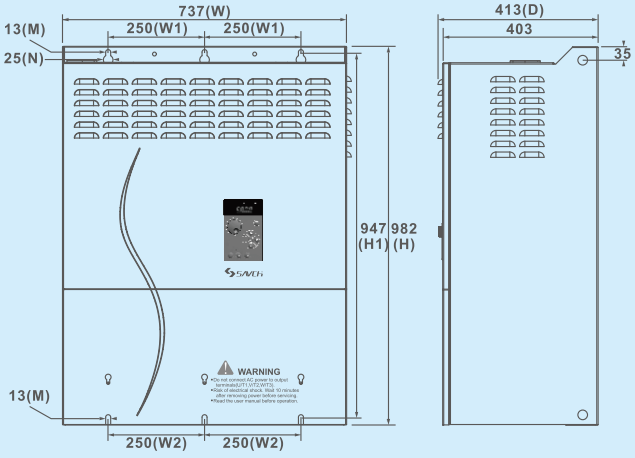
External Dimensions



Size 8	4T	220G/280P~315G



Size 9	4T	315G/355P~400G/450P



Size 10	4T	500G

• Inverter Size (Unit: mm)

Inverter Type	W	W1	W2	H	H1	D	M	N	Fig.
S3100-2T0.4G	108	94	94	138.1	118	159.5	5	5	Size 1
S3100-2T0.75G									
S3100-2T1.5G									
S3100-4T0.75G/1.5P									
S3100-4T1.5G/2.2P									
S3100-4T2.2G/4.0P									
S3100-2T2.2G	130	108	108	209	198	169.8	5	5	Size 2
S3100-2T4.0G									
S3100-4T4.0G/5.5P									
S3100-4T5.5G/7.5P									
S3100-2T5.5G	180	160	160	298	284	180	6.5	6.5	Size 3
S3100-2T7.5G									
S3100-4T7.5G/11P									
S3100-4T11G/15P									
S3100-4T15G/18.5P									
S3100-4T18.5G/22P									
S3100-4T22G/30P	260	176	176	412	397.5	203	6.5	13	Size 4
S3100-4T30G/37P									
S3100-4T37G/45P									
S3100-4T45G/55P	320	160	230	580	563	280	9	17	Size 5
S3100-4T55G/75P									
S3100-4T75G/90P									
S3100-4T90G/110P									
S3100-4T110G									
S3100-4T110G/132P	460	160	160	778	745	340	12.5	12.5	Size 6
S3100-4T132G/160P									
S3100-4T160G/200P									
S3100-4T200G/220P	393	150	150	882	849	413	13	25	Size 7
S3100-4T220G									
S3100-4T220G/280P	500	190	190	882	849	414	13	25	Size 8
S3100-4T280G/315P									
S3100-4T315G									
S3100-4T315G/355P	626	250	250	982	949	408	13	25	Size 9
S3100-4T355G/400P									
S3100-4T400G/450P									
S3100-4T500G	737	250	250	982	947	413	13	25	Size 10

COOPERATIVE CLIENT

Quanzhou Factory

Address: 3# Zixin Road, Jiangnan Hi-Tech Industrial Park, Quanzhou, Fujian, China

Tel: **+86 595 24678267** Fax: **+86 595 24678203**

Service Network

Website: **www.savch.net**

Qualification

Received **ISO9001** and **CE** recognition

520028031002 V1.2 2024-04-09

Sales service contact address

SAVCH Wechat Service Number