SANYU

SANYUDRIVE

A7S/A8S

High-Voltage Inverters

3-Phase 6kV 220kW-4350kW
3-Phase 6.6kV 220kW-4800kW
3-Phase 10kV 220kW-7100kW
3-Phase 11kV 220kW-8000kW

Sanyu Industry CO., Ltd

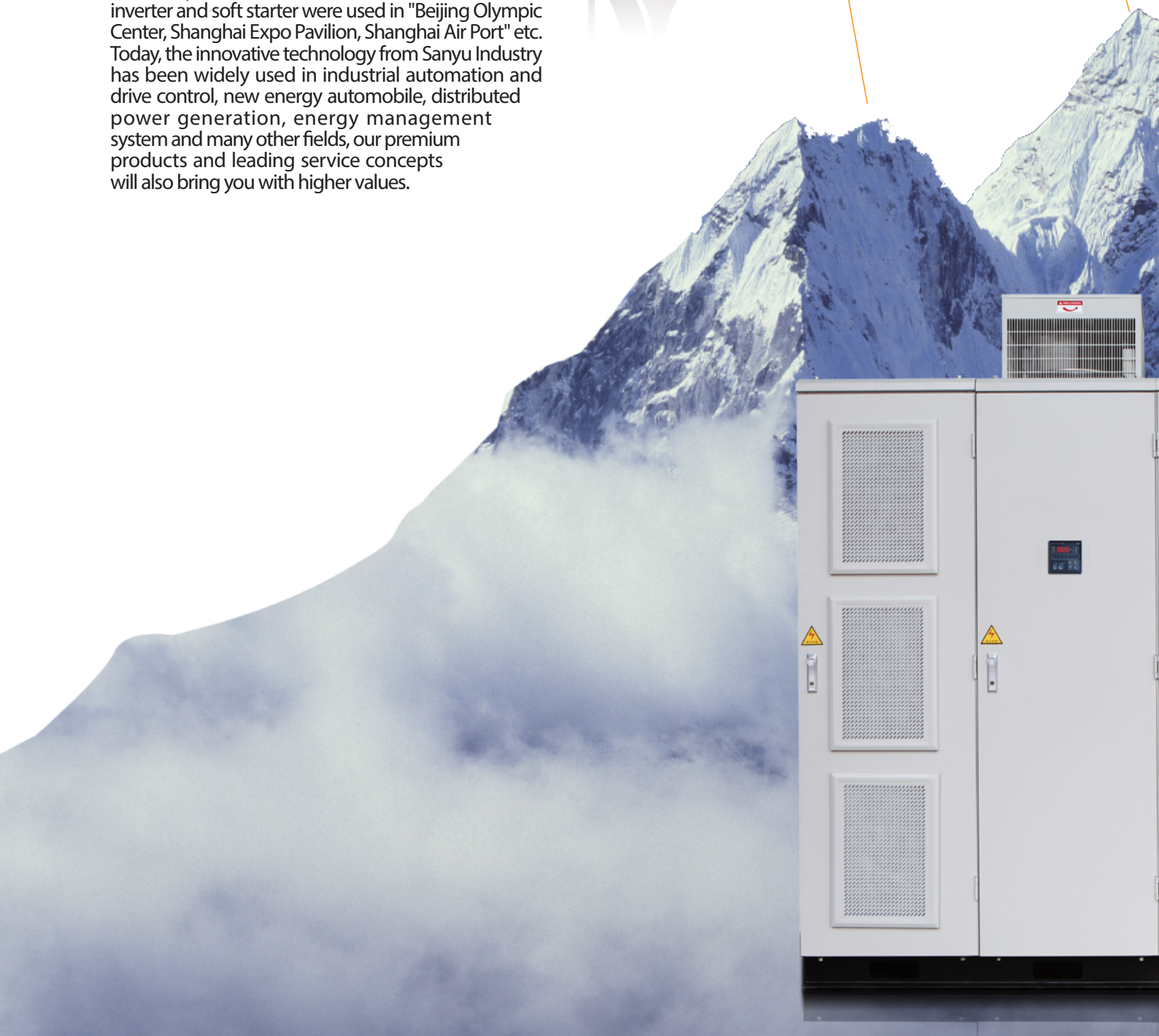
Sanyu Industry Co., Ltd. was founded in 1990. The head office is located in the state-level Economic and financial center - Pudong District, Shanghai LuJiaZui financial center. Sanyu Industry has passed the ISO9001 international quality system certification and national CCC, SGS, CE International Security Certification through years of hard work,.
Sanyu Industry is one of the leading manufacturers and exporters of AC drive, soft starter and welding machine in Shanghai China, which has about twenty years history in this field. Till now our products have been exported to more than 30 countries. Our inverter and soft starter were used in "Beijing Olympic Center, Shanghai Expo Pavilion, Shanghai Air Port" etc. Today, the innovative technology from Sanyu Industry has been widely used in industrial automation and drive control, new energy automobile, distributed power generation, energy management system and many other fields, our premium products and leading service concepts will also bring you with higher values.

Compact Structure

Using new compact circuit design, with smaller footprint, more convenient transportation and installation!

Excellent Performance

In addition to enhanced V/f, the vector control mode has also been added to satisfy the demands of various complicated occasions!



Reliable System

Adhere to the design concept of reliability and safety, to ensure the long-term stable system operation and reliable system protection.

Extensive Functions

In conjunction with several practical functions featured by SANYU, the inverters provide high energy saving and is pollution-free, also is convenient, stable and more secure!

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A7S/A8S

The smaller footprint minimizes the project investment costs!

Compact Structure

SANYUDRIVE A7S/A8S

Combining the latest international electrical control technology, the compact & simplified main circuit structure and the modular construction, SANYUDRIVE-A7S/A8S series of high-voltage inverters use the space efficiently, realizing the overall transportation, installation and other processes easily.

The small footprint and light weight facilitate the design selection, which efficiently saves the installation space, improves the installation efficiency and become the first choice!

Touch-Screen

The 10.4" super-large LCD touch screen provides friendly all-Chinese or all-English graphical interface, online help for functional code setting, intuitive and easy operation, easy parameter setting, running log, status monitoring and other functions.

Temperature Controller

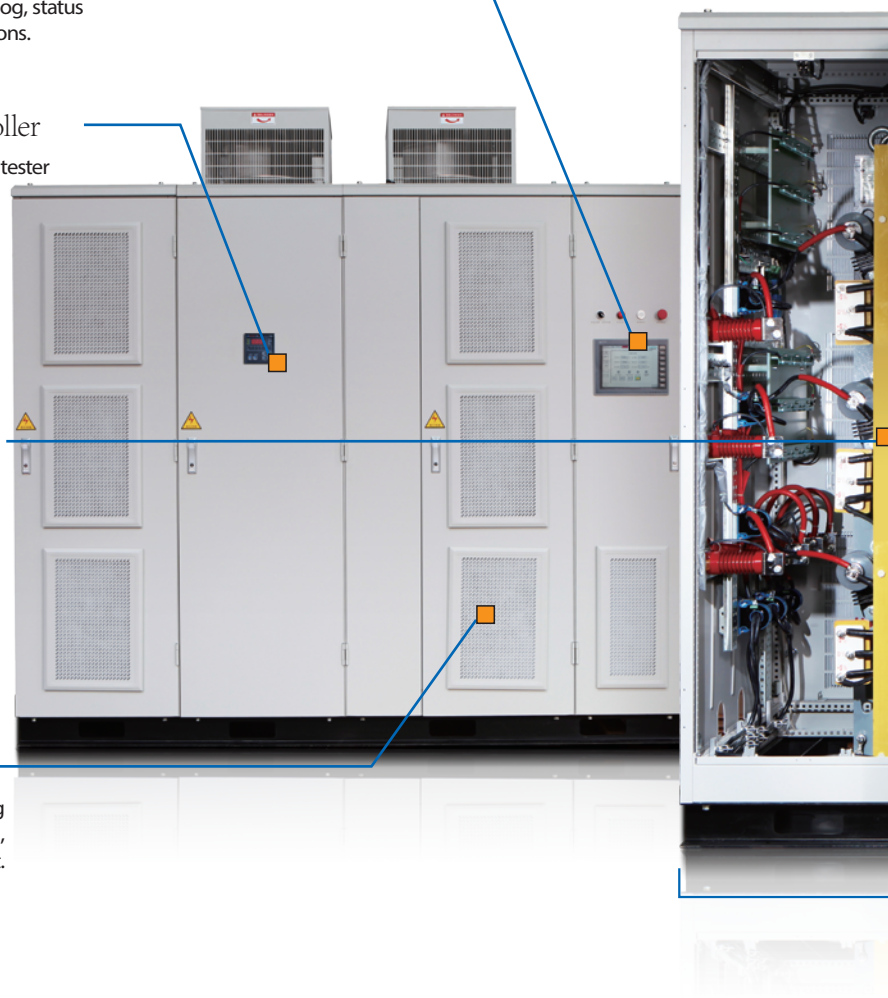
Three-phase digital logging tester

Phase-shifting transformer

The isolating phase-shifting transformer realizes the harmonic offset; the input harmonic meets the IEEE-519-1992 standard and the GB/T14549-93 standard, lowering the harmonic pollution to the power grids.

Dust-proof Device

Can be replaced during normal inverter operation, which is safe and convenient.



System cooling fan

Using the high-quality imported high-performance centrifugal fan.
Separate duct and centralized cooling
Long service life, high reliability.

Main Controller

The use of high-end dual-chip 32-bit DSP and FPGA provides strong computing capability. Through fiber-optic communication with power unit and with complete electrical isolation, the system is equipped with extremely high safety, immunity and reliability.

Independent Control Cabinet

Separate high-voltage and low-voltage design, with strong immunity as well as high safety and reliability.
Pull-out control panel, with simple operation and convenient maintenance.

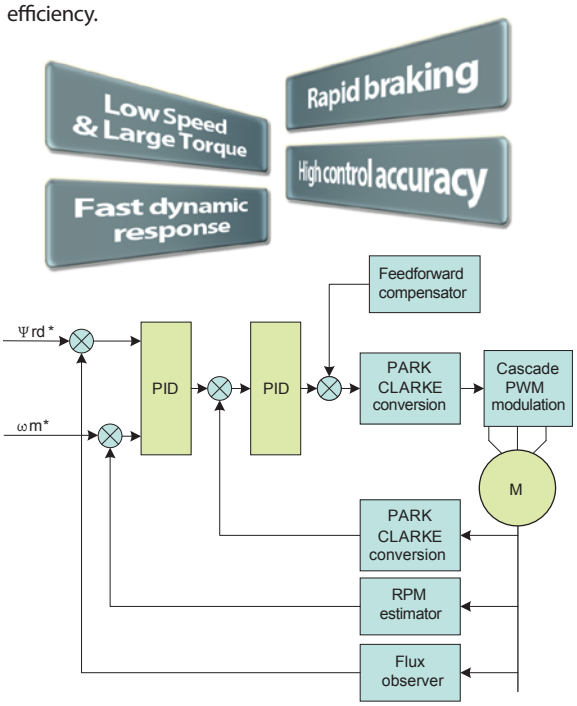
Small-sized Power Unit

The second generation of power unit, with modular and compact design, the moisture-proof circuit board provides favorable dust resistance, easy accessibility and high interchangeability.

Excellent Performance

High-performance vector control

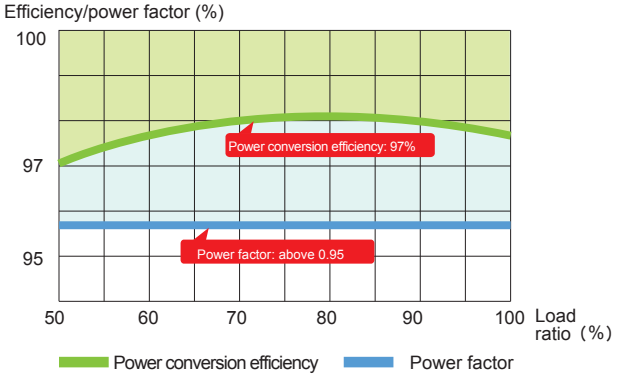
SANYUDRIVE-A7S/A8S series of high-voltage inverters are equipped with vector control functions. They can be used in occasions with low speed & large torque, fast dynamic response, high control accuracy or rapid braking; they also bring the entire drive system with higher reliability and better overall running efficiency.



High level of conversion efficiency

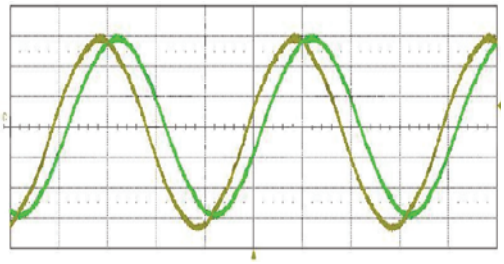
Inheriting the SANYU electrical conversion technology, SANYUDRIVE-A7S/A8S series of high-voltage inverters provide with the industry-leading high power conversion efficiency, with an overall efficiency of over 97%, which minimize the waste of electrical resources.

Sketch of power conversion efficiency ratio



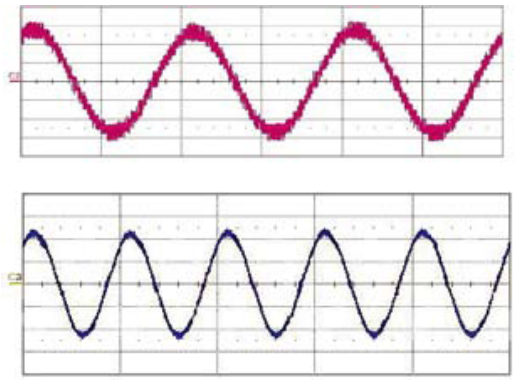
High-quality harmonic characteristics

Waves of input voltage & current



The multiple inputs have no harmonic pollution to the power grids, meeting the IEEE Std519-1992 and GB/T14549-93 standards.

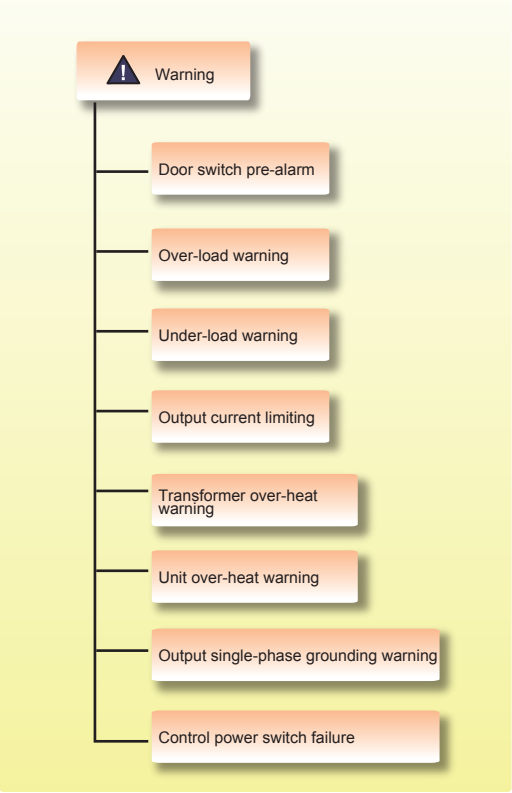
Waves of output voltage & current

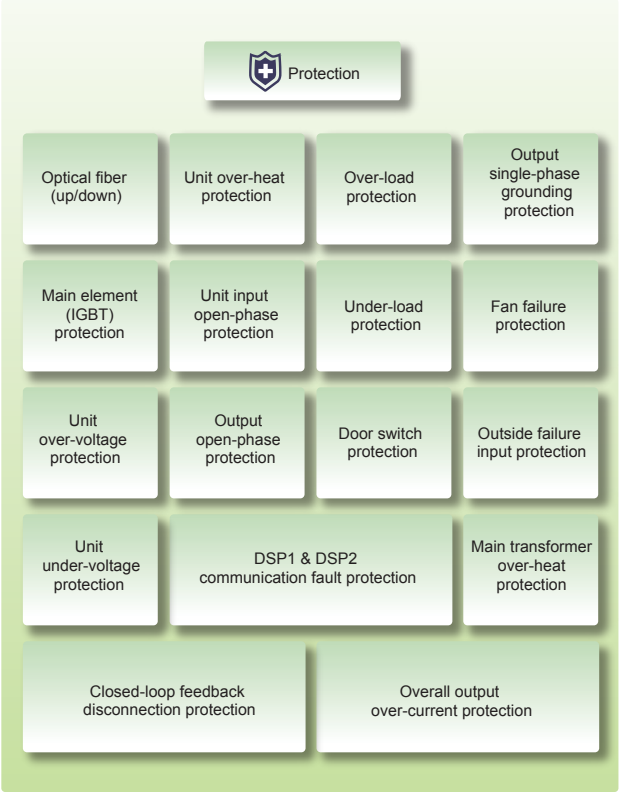


The output adopts the carrier wave phase-shifting PWM, without the need of output filter. The output harmonic meets the GB and IEEE standards, with small dv/dt and has no special requirements on the motor.

Reliable System

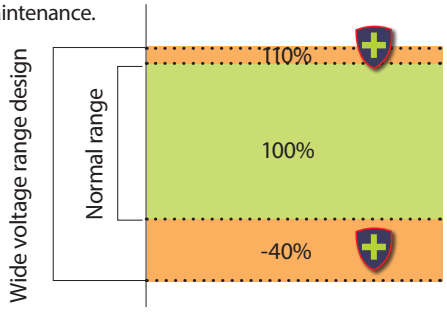
Perfect warning & protection functions





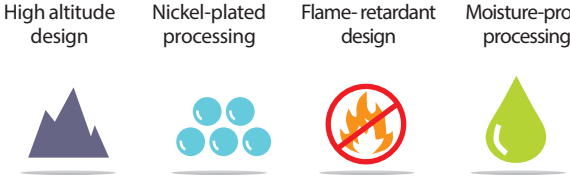
System Redundancy Design

- Dual control power design, which can realize the stable operation during short power outage.
- Strict derating design, with large allowance and long life for main elements.
- Wide voltage range design, which can realize the stable operation within the range of -40% ~ +10%.
- Modular unit design, with interchangeability and easy for local maintenance.



Strong Adaptability

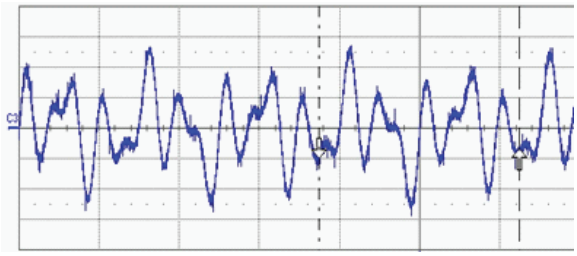
- The moisture-proof control board improves the circuit anti-pollution capability.
- The nickel-plated copper boards of the overall device and the units enhance the adaptability under harsh working conditions.
- High altitude design, which can be used at 3000m above sea level.
- Overall flame-retardant design, which improves the safety performance.



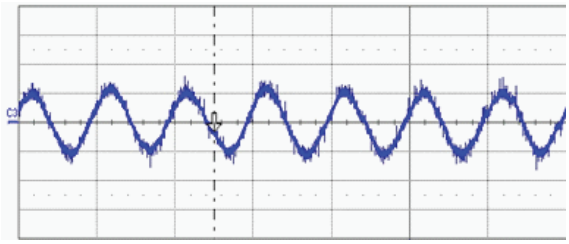
Extensive Functions

Current instability eliminating function

When the motor is light-loaded, the phenomena of current instability may occur under normal circumstances; the proprietary SANYU technology can significantly eliminate the phenomena of current instability caused by dead zone or too light load.



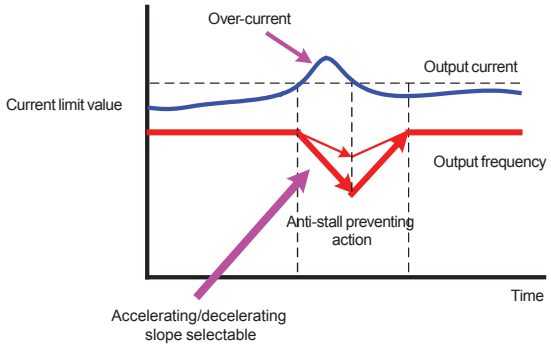
Without current instability eliminating function



With current instability eliminating function

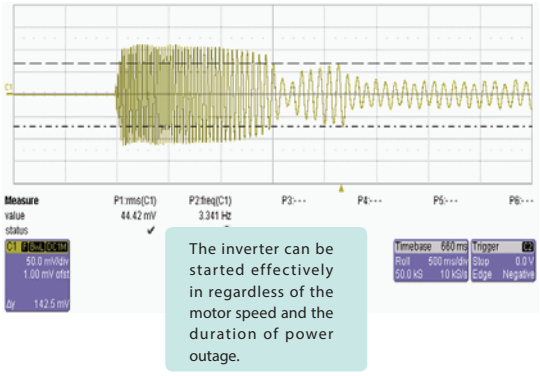
Automatic anti-stall function

- In case of accelerating/decelerating:
  Flat the accelerating/decelerating slope, to change it along the direction of time extending to the preset frequency.
- In case of constant-speed running:
  If the inverter output current exceeds the current limit value, the output current must be reduced by lowering the output frequency.

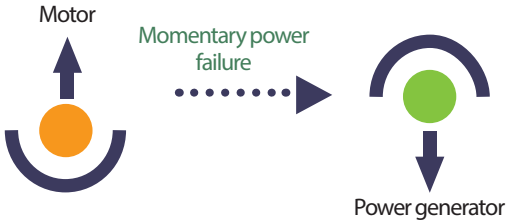


Unique speed search startup function

When you start the inverter in case that the motor rotates freely, the advanced speed search function is used to search the free rotation speed and direction of the motor, which can realize the reliable startup and effectively avoid the over-current occurred at the startup during free motor rotation.



- The motor maintains the power generation mode in the event of momentary power failure, and the speed of DC bus voltage drop is reduced by utilizing the feedback energy from the loads.
- The instantaneous power failure restart function should be used even in under-voltage protection; the speed-track startup will be realized automatically after the grid voltage is recovered.



Intelligent PID function

- Internal PID function: the closed-loop control of the controlled variables can be realized without the need of external PID controller.
- Intelligent PID function: using the fuzzy control theory, the proportion, integral and differential parameters can be automatically adjusted online according to the deviation and deviation change rate, without the need of user setting, which realizes the closed-loop control of the controlled variables and facilitates the user closed-loop control!

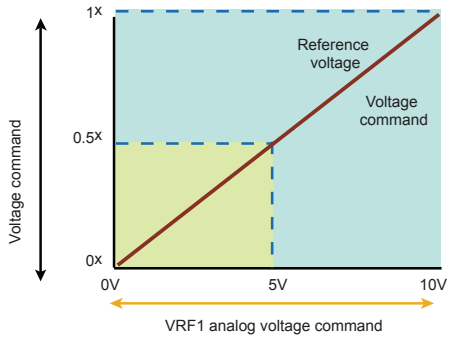
Functional code group	No.	Functional designation	Numerical value	Description
Internal closed-loop adjusting parameter F6	0	Closed-loop control mode	0	Open-loop control
			1	PID control
			2	Fuzzy control

V/f separation control mode

It can completely independently control the output frequency and voltage, and can effectively control the special motors.

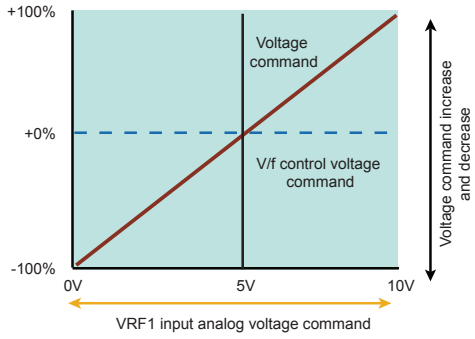
V/f proportional separation mode

It can effectively take use of the original V/f pattern, and will increase or decrease the voltage ratio through external analog input. It is used for special motors or used as the countermeasures for over-excitation that may occur during the motor acceleration/ deceleration.



V/f complete separation mode

It can completely independently control the frequency and voltage. The output voltage is controlled by external mode, and is used to control the torque motor or to increase the freedom of external control.



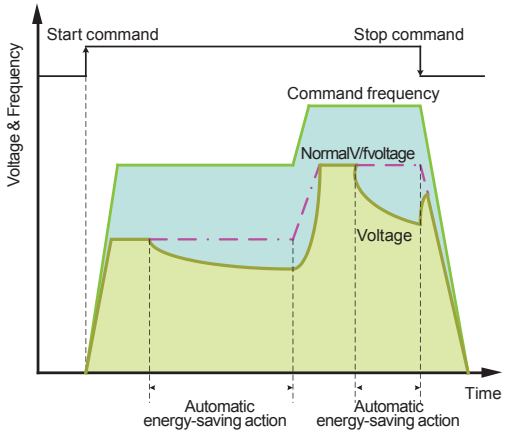
Multi-segment V/f curve, graphical operation function

Functional code group	No.	Functional designation	Numerical value	Description
Graphical operating parameters F3	0	Graphical operating mode switch	0	Without graphical operating function
			1	Operate one cycle and then stop
			2	Operate repeatedly
			3	Operate one cycle and then operate with the final speed

Automatic Energy-Saving Function

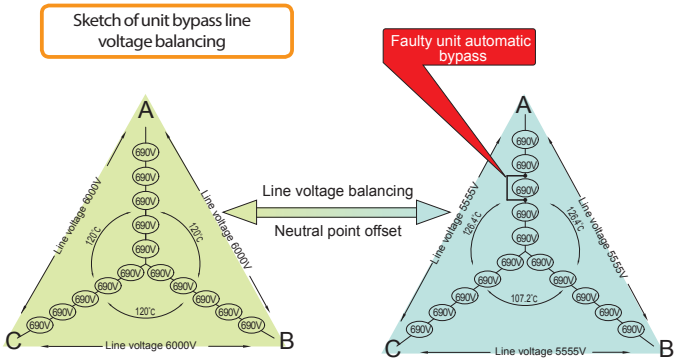
Using the unique SANYU automatic energy-saving function, the energy-saving is achieved by providing high-efficient voltage according to the torque required by the loads, therefore realizing the double effects of energy-saving in inverters.

For the changes of frequency setting, stoppage and the dramatical changes of load, the energy-saving mode can be quickly restored to the normal output voltage, to avoid the insufficient load torque.



Unit bypassing and line voltage balancing technology

- Optional IGBT faulty unit bypassing, line voltage balanced output, the reset operation can be carried out when an individual unit is damaged.
- Up to 2 units can be bypassed in the same phase, and 3 units can be bypassed for the entire system!



Industrial Applications

Main industries

Blast furnace blowers, induced draft fans, primary/secondary dust-removing fans, exhaust fans, compressor fans, condensate pumps, circulating pumps, slag-washing pumps, mud pumps, feed pumps, scale-removing pumps, compressors, cold rolling mills, hot rolling mills, crushers, etc.

Water supply pumps, water intake pumps, purification pumps, circulating pumps, sewage pumps, blowers, induced draft fans, booster pumps, lift pumps, etc.

Main pipeline pumps, injection pumps, circulating pumps, electric submersible pumps, brine pumps, blast furnace blowers, primary/secondary dust-removing fans, induced draft fans, blowers, scale-removing pumps, compressors, extruders, oil pumps, etc.

Induced draft fans, blowers, boiler water feed pumps, condensate pumps, circulating pumps, exhaust fans, mortar pumps, etc.

Dust-removing fans, mine ventilators, belt conveyors, ball mills, granite crushers, mine lifters, diggers, drainage pumps, exhaust fans, medium pumps, etc.

Kiln induced draft fans, forced fans, cooler dust-collecting fans, raw material grinders, kiln air supply blowers, coolers, exhaust blowers, separator fans, main dust-collecting fans, etc.

Wind tunnels, heavy-duty gas turbines, etc

Application advantages of SANYU high-voltage inverters

Energy-saving Operation

- The original power frequency baffle board control mode has been changed into the V/f motor speed control mode, which can realize significant energy savings.
- The advanced energy-saving technology of SANYU high-voltage inverter enables that the motor is always running efficiently, and the internal automatic energy-saving function can further achieve the double effect of energy saving.

High Reliability

- In case of instantaneous power failure, the SANYU high-voltage inverter runs a unique low-voltage compensation function, and will also maintain the operation by effectively utilizing the feedback energy from the motor. The greater is the load inertia, the better is the performance.
- Along with the advanced forward/reverse speed tracking function, the inverter can start smoothly during bus switchover and when the motor rotates freely.
- The SANYU high-voltage inverter is provided with the minimum frequency setting function, which can prevent the situation that there is no water supply to the pump, therefore ensuring the stable water supply.
- During constant-speed operation: if the SANYU high-voltage inverter output current exceeds the current limit value, the output current must be reduced by lowering the output frequency. This will make the users feel peace of mind.

Internal PID Functions

- The closed-loop control of the controlled variables can be realized without an external PID controller, which improves the quality of work, reduces the labor intensity, enables the unattended operation and saves the management costs.

Inherent advantages of V/f speed requlation

- Avoid the constant-speed operation, as well as the high outlet pressure and severe pipe damage during value adjustment.
- The superior performance of V/f regulation helps to realize the reconstruction of distributed control system, further improving the system optimization and increasing the degree of control automation.
- Prolong equipment service life, reduce the maintenance costs.
- With V/f regulation, the motor speed has been reduced, which greatly reduces the impact of environmental noise.

Industrial Applications

Working characteristics of fans and pumps

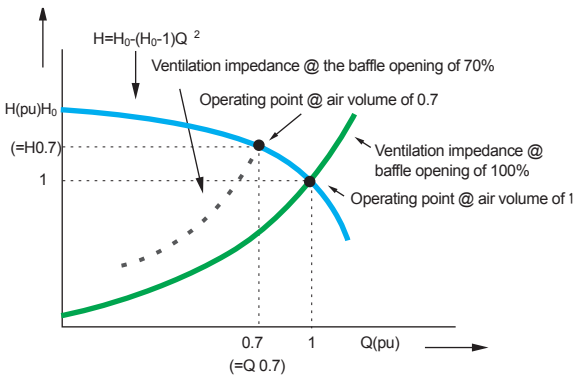
① Features of fans and pumps:$H=H_0-(H_0-1)\times Q^2$
H – Head, Q – Flowrate, H_0 – Head @ flowrate 0
Pipeline resistance:$R=KQ^2$,
R – Pipeline resistance, K – Pipeline damping factor,
Q – Flowrate
Notes: The above variables are all in per unit, with the rated value as the reference, the value of 1 indicates the actual value is equal to the rated value.

② Fan and pump shaft power P:
$P=KpQH/\eta$
P – Shaft power, Q – Flowrate, H – Pressure,
η – fan and pump efficiency,
Kp – Calculation constant

③ Relationships between flowrate, pressure, power and speed:
$Q_1/Q_2=n_1/n_2$; $H_1/H_2=(n_1/n_2)^2$; $P_1/P_2=(n_1/n_2)^3$

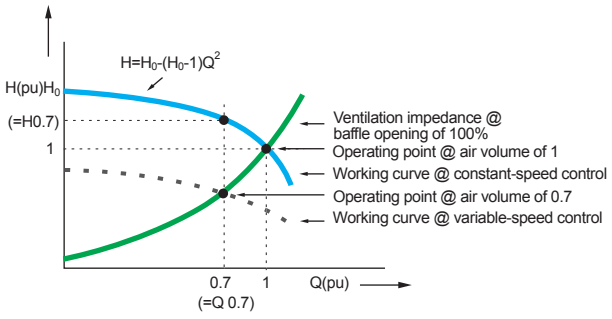
Variable-valve Control

Variable-valve control adjusts the flowrate of pumps and fans by changing the opening of pipeline valve. When adjusting the valve, the pump or fan power is essentially the same; the pump or fan performance curve maitains unchanged, while the pipeline resistance characteristic changes; the intersection point between the pump or fan performance curve and the new pipeline resistance characteristic curve is the new operating point.



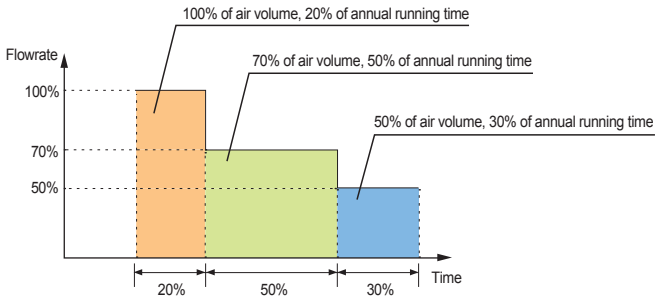
Variable-frequency Control

Variable-frequency control changes the operating point by changing the performance curve, without additional resistance during the variable-speed control; it is a more ideal control method. The stepless speed regulation of AC motor can be realized by changing the power supply working frequency through V/f control. When using the variable speed control, the efficiency of the pumps and fans is almost unchanged, the flowrate changes with the speed by the law of first power, while the shaft power will change by the law of third power; the V/f control is also used to reduce the fan or pump noise, therefore reducing the wear and prolonging the service life.



Pilot calculation of nergy-saving (only for reference)

Efficiency of motor in a certain power plant: 98%
Shaft power @ rated air volume: 1000kW
Fan characteristics: when the air volume Q is 0, the head will be 1.4p.u. (Per Unit, with rated value as the reference); with a curve characteristic of $H=1.4-0.4Q^2$, the annual running time is 8,000 hours
Fan operating mode:



When the air volume is regulated by variable-valve control:

According to the fan & pump characteristic formula①and the shaft power calculation formula②, calculate the fan power consumptions at different air volumes.
Assuming P_{100} is the power consumption @ 100% of air volume, P_{70} is the power consumption @ 70% of air volume, P_{50} is the power consumption @ 50% of air volume
$P_{100}=1000/0.98=1020kW$
$P_{70}=1000\times0.7\times(1.4-0.4\times0.49)/0.98=860kW$
$P_{50}=1000\times0.5\times(1.4-0.4\times0.25)/0.98=663kW$

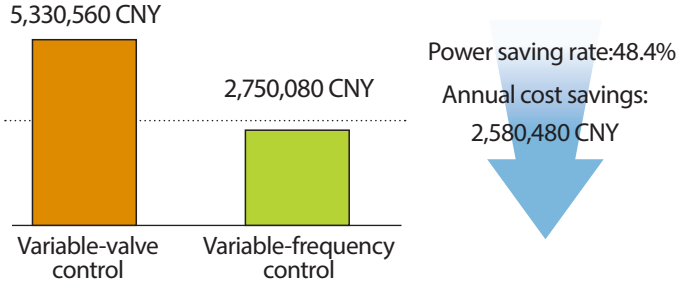
When the air volume is regulated by variable-frequency control:

According to the relationship formula between fan & pump shaft power, flowrate, pressure and speed ③, calculate the fan power consumptions at different air volumes.
Assuming P_{100} is the power consumption @ 100% of air volume, P_{70} is the power consumption @ 70% of air volume, P_{50} is the power consumption @ 50% of air volume
$P_{100}=1000/0.98/0.97=1052kW$
$P_{70}=1000\times0.343/0.98/0.97=360kW$
$P_{50}=1000\times0.125/0.98/0.97=131kW$

Annual motor power consumption = power usage @ 100% of air volume + power usage @ 70% of air volume + power usage @ 50% of air volume

The annual power consumption of this motor will be::
$(1020\times8000\times0.2)+(860\times8000\times0.5)+(663\times8000\times0.3)$
=6, 663, 200kWH
Assuming the electricity charge is CNY 0.8/KWH, the annual power costs will be:
$6663200\times0.8=5,330,560$ CNY

The annual power consumption of this motor will be:
$(1052\times8000\times0.2)+(360\times8000\times0.5)+(131\times8000\times0.3)$
=3, 437, 600kWH
Assuming the electricity charge is CNY 0.8/KWH, the annual power costs will be:
$3437600\times0.8=2,750,080$ CNY



Product Principles

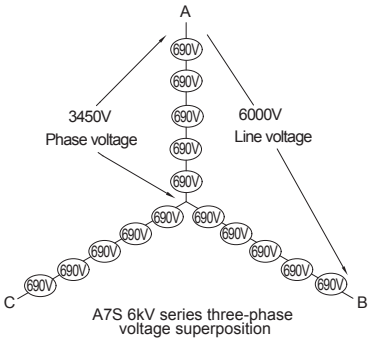
SANYUDRIVE-A7S 6kV

SANYUDRIVE-A7S/A8S high-voltage inverter adopts the serial multi-level technology, and is an inverter with high-high voltage source.
SANYUDRIVE-A7S 6kV series can directly input and output 6kV voltage. The 6kV series are composed of five power units connected in series, with each power unit powered by the secondary isolation coil for the isolation transformer respectively, the output three-phase constitutes a Y-shape and provides power supply directly to the 6kV motor.

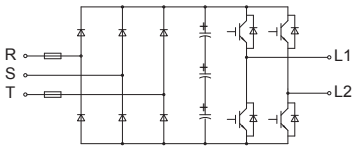
The structure of power unit is of AC-DC-AC mode, each power unit is mainly composed of the input fuse, three-phase full-bridge rectifier, capacitor bank, IGBT inverter bridge and DC bus, also including the control drive circuit. Each unit adopts the three-phase input, the output voltage states of the pulse width modulation type inverter with single-phase output are 1, 0 and -1. The superimposed five units in each phase of 6kV can produce 11 different levels of phase voltage.

This structure uses low-voltage devices to achieve a high-voltage output, reducing the voltage withstanding requirements on the power devices, with very small harmonic pollution to the power grids. Since the input power factor is high, there is no need to use input harmonic filter and the power factor compensator, and the output waveform is similar to the sine wave.

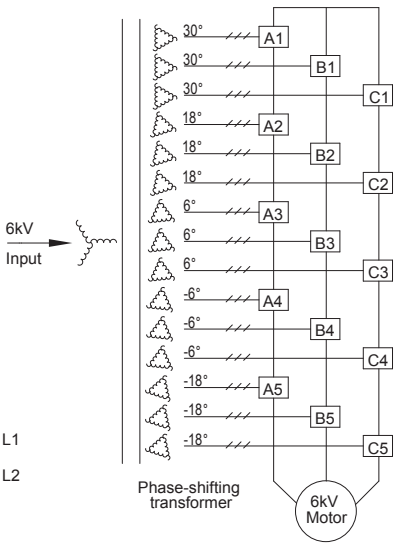
By controlling the mutual angle of power unit output PWM and using the carrier phase-shifting technology, the dv/dt of output PWM waveform is maintained very low; meanwhile, through the effect of mutual harmonic elimination, the excellent output harmonic performance can be realized at low carrier frequency.



A7S 6kV series three-phase voltage superposition



Principles of power unit



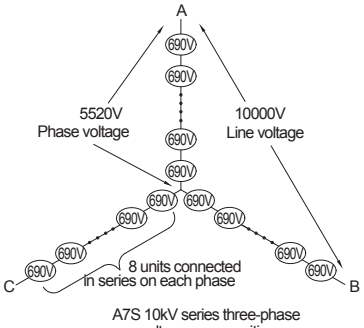
A7S 6kV system topology

SANYUDRIVE-A7S 10kV

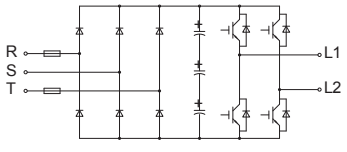
SANYUDRIVE-A7S 10kV series can directly input and output 10kV voltage. Each phase of 10kV series is composed of eight power units connected in series, with each power unit powered by the secondary isolation coil for the isolation transformer respectively, the output three-phase constitutes a Y-shape and provides power supply directly to the 10kV motor.

The power units for 10kV series are interchangeable with those for 6kV; the superimposed eight units on each phase can produce 17 different levels of phase voltage. The harmonic pollution to the power grid is very small. Since the input power factor is high, there is no need to use input harmonic filter and the power factor compensator, and the output waveform is similar to the sine wave.

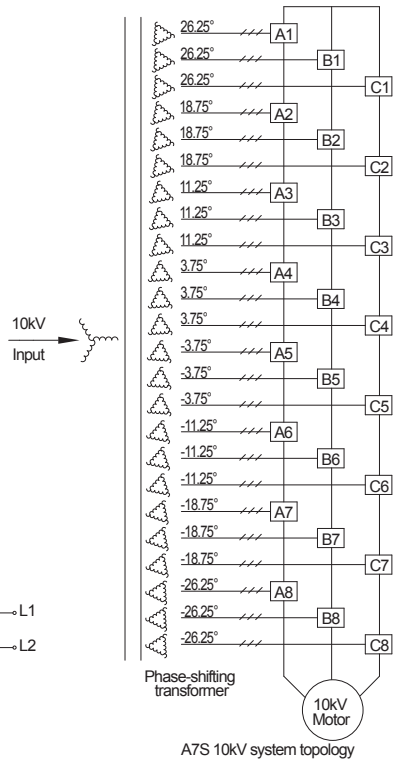
By controlling the mutual angle of power unit output PWM and using the carrier phase-shifting technology, the dv/dt of output PWM waveform is maintained very low; meanwhile, through the effect of mutual harmonic elimination, the excellent output harmonic performance can be realized at low carrier frequency.



A7S 10kV series three-phase voltage superposition



Principles of power unit



A7S 10kV system topology

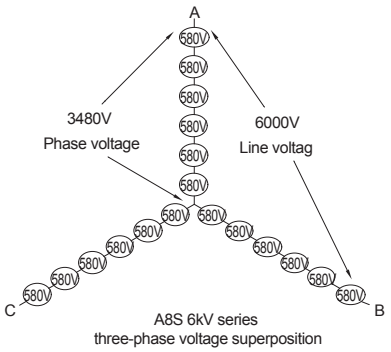
SANYUDRIVE-A8S 6/6.6kV

Each phase of SANYUDRIVE-A8S 6kV and 6.6kV series is composed of 6 power units connected in series, with 36-pulse at input side, the input voltage at transformer primary side is 6kV or 6.6kV, the secondary side is divided into 18 windings, the difference of phase angle between 6 windings of the same phase is 10° , this can eliminate the harmonic below 35 in the input current, and ensure the harmonic performance of input current can meet the requirements of appropriate international and domestic standards.

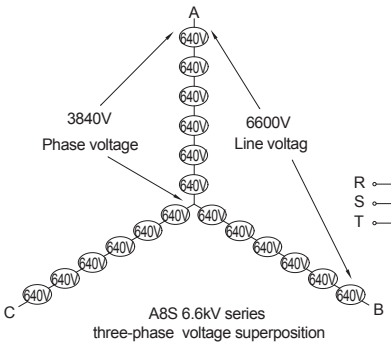
SANYUDRIVE-A8S-6-6 model adopts 6 units connected in series, with a unit input voltage of 580V, 6 units can generate 3840V on one phase, and the line voltage is 6kV.

SANYUDRIVE-A8S-6.6-6.6 model adopts 6 units connected in series, with a unit input voltage of 640V, 6 units can generate 3840V on one phase, and the line voltage is 6.6kV.

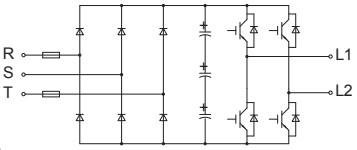
By controlling the mutual angle of power unit output PWM and using the carrier phase-shifting technology, the dv/dt of output PWM waveform is maintained very low; meanwhile, through the effect of mutual harmonic elimination, the excellent output harmonic performance can be realized at low carrier frequency. For the 6-unit structure connected in series, the output phase voltage is of level 13, the output line voltage is of level 25.



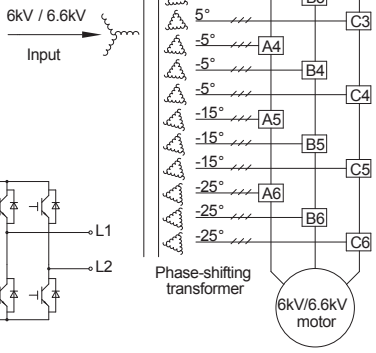
A8S 6kV series
three-phase voltage superposition



A8S 6.6kV series
three-phase voltage superposition



Principles of power unit



A8S 6/6.6kV system topology

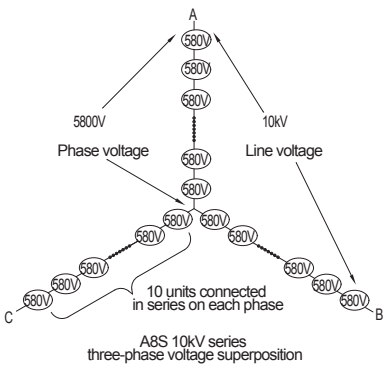
SANYUDRIVE-A8S 10/11kV

Each phase of SANYUDRIVE-A8S 10kV and 11kV series is composed of 10 power units connected in series, with 60-pulse at input side, the input voltage at transformer primary side is 10kV or 11kV, the secondary side is divided into 30 windings, the difference of phase angle between 10 windings of the same phase is 6° , this can eliminate the harmonic below 59 in the input current, and ensure the harmonic performance of input current can meet the requirements of appropriate international and domestic standards.

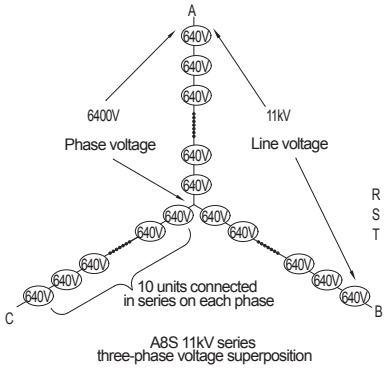
Each phase of SANYUDRIVE-A8S 10kV and 11kV series is composed of 10 power units connected in series; for 10kV series, the three-phase AC input voltage of each power unit is 580V, 10 units can generate 5800V on one phase, and the line voltage is 10kV. For 11kV series, the three-phase AC input voltage of each power unit is 640V, 10 units can generate 6400V on one phase, and the line voltage is 11kV.

By controlling the mutual angle of power unit output PWM and using the carrier phase-shifting technology, the dv/dt of output PWM waveform is maintained very low; meanwhile, through the effect of mutual harmonic elimination, the excellent output harmonic performance can be realized at low carrier frequency.

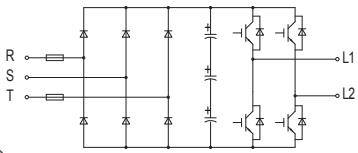
The 10 units of SANYUDRIVE-A8S 10kV and 11kV are connected in series to output PWM, the output phase voltage is of level 21, and the output line voltage is of level 41.



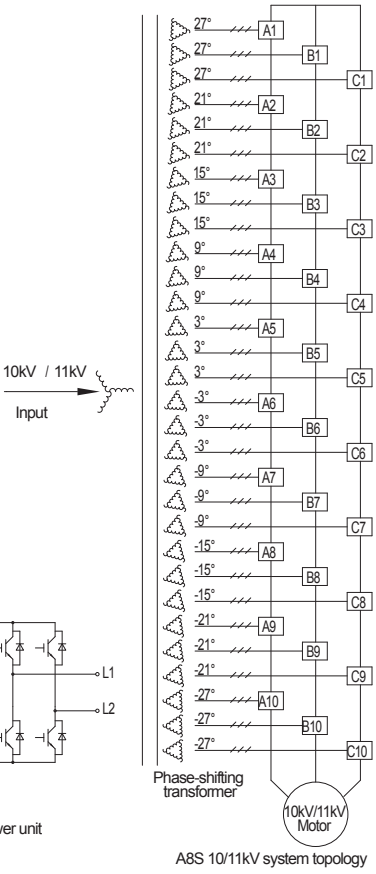
A8S 10kV series
three-phase voltage superposition



A8S 11kV series
three-phase voltage superposition



Principles of power unit



A8S 10/11kV system topology

Standard Specification

Product Series													
A7S	6kV Series	Model: SUPERDRIVE-A7S-6-6-□kW		220	250	280	315	355	400	450	500	560	630	710
		Output Specification	Compatible motor power(kW)	220	250	280	315	355	400	450	500	560	630	710
			Rated output curren(A)	28	32	35	40	45	50	55	61	67	79	87
			Main transformer capacity(kVA)	290	330	360	420	470	520	570	630	700	820	900
			Rated output voltage											
			Rated over-load current											
			Number of series											
		Input power supply	Main circuit ※1											
			Control circuit											
			Allowable fluctuation											
		Approximate weight (kg)		2500			2700		2900			3500		
		Approximate heat generation (kW)		6.6	7.5	8.4	9.5	10.7	12	13.5	15	16.8	18.9	21.3
		Ventilation rate(m^3/h)		7000										10000
	10kV Series	Mode: SUPERDRIVE-A7S-10-10-□kW		280	315	355	400	450	500	560	630	710	800	900
		Output Specification	Compatible motor power (kW)	280	315	355	400	450	500	560	630	710	800	900
			Rated output current(A)	24	26	29	32	35	40	44	50	55	60	67
			Main transformer capacity(kVA)	400	450	500	550	600	700	760	870	950	1000	1160
			Rated output voltage											
			Rated over-load current											
			Number of series											
		Input power supply	Main circuit											
			Control circuit											
			Allowable fluctuation											
		Approximate weight (kg)		2800		3000		3200		3300		3500		4200
		Approximate heat generation (kW)		8.4	9.5	10.7	12	13.5	15	16.8	18.9	21.3	24	27
		Ventilation rate(m^3/h)		10000						12000				15000
A8S	6kV Series	Model: SUPERDRIVE-A8S-6-6-□kW		220	250	280	315	355	400	450	500	560	630	710
		Output Specification	Compatible motor power (kW)	220	250	280	315	355	400	450	500	560	630	710
			Rated output current(A)	28	32	35	40	45	50	55	61	67	79	87
			Main transformer capacity(kVA)	290	330	360	420	470	520	570	630	700	820	900
			Rated output voltage											
			Rated over-load current											
			Number of series											
		Input power supply	Main circuit ※2											
			Control circuit											
			Allowable fluctuation											
		Approximate weight (kg)		2800			3000		3300			3800		
		Approximate heat generation (kW)		6.6	7.5	8.4	9.5	10.7	12	13.5	15	16.8	18.9	21.3
		Ventilation rate(m^3/h)		7000										10000
	6.6kV Series	Model: SUPERDRIVE-A8S-6.6-6.6-□kW		220	250	280	315	355	400	450	500	560	630	710
		Output Specification	Compatible motor power (kW)	220	250	280	315	355	400	450	500	560	630	710
			Rated output current(A)	26	29	32	37	41	46	50	55	61	72	79
			Main transformer capacity(kVA)	290	330	360	420	470	520	570	630	700	820	900
			Rated output voltage											
			Rated over-load current											
			Number of series											
		Input power supply	Main circuit ※3											
			Control circuit											
			Allowable fluctuation											
		Approximate weight (kg)		2800			3100		3400			3800		4200
		Approximate heat generation (kW)		6.6	7.5	8.4	9.5	10.7	12	13.5	15	16.8	18.9	21.3
		Ventilation rate(m^3/h)		7000										
	10kV Series	Model: SUPERDRIVE-A8S-10-10-□kW		280	315	355	400	450	500	560	630	710	800	900
		Output Specification	Compatible motor power (kW)	280	315	355	400	450	500	560	630	710	800	900
			Rated output current(A)	24	26	29	32	35	40	44	50	55	60	67
			Main transformer capacity(kVA)	400	450	500	550	600	700	760	870	950	1000	1160
			Rated output voltage											
			Rated over-load current											
			Number of series											
		Input power supply	Main circuit											
			Control circuit											
			Allowable fluctuation											
		Approximate weight (kg)		3000		3200		3500		3800		4200		4500
		Approximate heat generation (kW)		8.4	9.5	10.7	12	13.5	15	16.8	18.9	21.3	24	27
		Ventilation rate(m^3/h)		10000						12000				15000
	11kV Series	Model: SUPERDRIVE-A8S-11-11-□kW		315	355	400	450	500	560	630	710	800	900	1000
		Output Specification	Compatible motor power (kW)	315	355	400	450	500	560	630	710	800	900	1000
			Rated output current(A)	24	26	29	31	37	40	46	50	55	61	66
			Main transformer capacity(kVA)	450	500	550	600	700	760	870	950	1050	1160	1250
			Rated output voltage											
			Rated over-load current											
			Number of series											
		Input power supply	Main circuit											
			Control circuit											
			Allowable fluctuation											
		Approximate weight (kg)		3000		3200		3500		3800		4200		4500
		Approximate heat generation (kW)		9.5	10.7	12	13.5	15	16.8	18.9	21.3	24	27	30
		Ventilation rate(m^3/h)		10000					12000				15000	

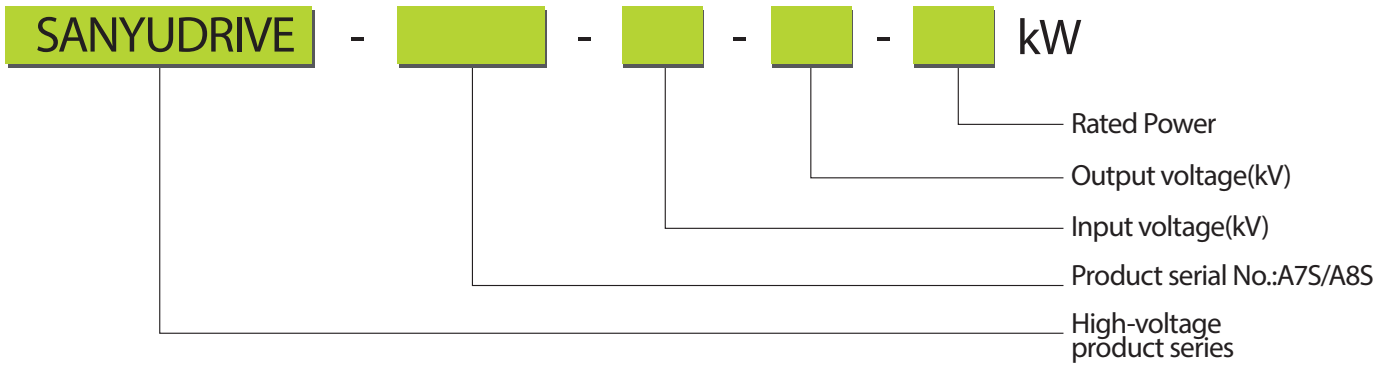
※1 The main circuit input voltage of this series could be: three-phase 10kV, 50Hz, corresponding model: SANYUDRIVE-A7S-10-6-□kW
※2 The main circuit input voltage of this series could be: three-phase 10kV, 50Hz, corresponding model: SANYUDRIVE-A8S-10-6-□kW

Specification

800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3000	3150	3550	4000	4350	
800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3000	3150	3550	4000	4350	
100	110	120	135	144	170	192	217	245	270	300	337	360	380	420	465	500	
1000	1150	1250	1400	1500	1770	2000	2250	2500	2800	3150	3500	3750	3950	4370	4840	5520	
6kV																	
120%/1 minute																	
5-stage serial connection, totally 15 power units																	
Three-phase 6kV, 50Hz																	
Single-phase 220V, 50Hz																	
Voltage: ±10% (-10%～-40% for derating), frequency: ±10%																	
3900			5500			6500			7500		8500		10000		12000		
24	27	30	33.6	37.5	42	48	54	60	67.2	75	84	90	94.5	106.5	120	130.5	
			15000			20000			25000						28000		
1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100
1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100
76	87	95	100	120	130	144	160	192	200	230	260	288	330	360	410	456	500
1300	1500	1650	1750	2000	2250	2500	2800	3350	3500	4000	4500	5000	5700	6250	7000	7900	8600
10kV																	
120%/1 minute																	
8-stage serial connection, totally 24 power units																	
Three-phase 10kV, 50Hz																	
Single-phase 220V, 50Hz																	
Voltage: ±10% (-10%～-40% for derating), frequency: ±10%																	
4600			5000			6500			7500		9000		12000	13000	14000	15000	16000	17000
30	33.6	37.5	42	48	54	60	67.2		75	84	94.5	106.5	120	135	150	168	189	213
18000					20000				25000				35000			43000		
800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3000	3150	3550	4000	4350	
800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3000	3150	3550	4000	4350	
100	110	120	135	144	170	192	217	245	270	300	337	360	380	420	465	500	
1000	1150	1250	1400	1500	1770	2000	2250	2500	2800	3150	3500	3750	3950	4370	4840	5520	
6kV																	
120%/1 minute																	
6-stage serial connection, totally 18 power units																	
Three-phase 6kV, 50Hz																	
Single-phase 220V, 50Hz																	
Voltage: ±10% (-10%～-40% for derating), frequency: ±10%																	
4200			5800			7000			8000		9000		12000		13000		
24	27	30	33.6	37.5	42	48	54	60	67.2	75	84	90	94.5	106.5	120	130.5	
			15000			20000			25000						31000		
800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3000	3150	3550	4000	4500	4800
800	900	1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3000	3150	3550	4000	4500	4800
87	100	109	120	132	155	175	197	217	245	276	300	328	345	382	424	486	500
1000	1150	1250	1370	1500	1770	2000	2250	2500	2800	3150	3430	3750	3950	4370	4840	5560	5720
6.6kV																	
120%/1 minute																	
6-stage serial connection, totally 18 power units																	
Three-phase 6.6kV, 50Hz																	
Single-phase 220V, 50Hz																	
Voltage: ±10% (-10%～-40% for derating), frequency: ±10%																	
4600			5800		6800		7500		8500		10000		12000		13000		
24	27	30	33.6	37.5	42	48	54	60	67.2	75	84	90	94.5	106.5	120	135	144
10000				15000		20000			25000					31000			
1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100
1000	1120	1250	1400	1600	1800	2000	2240	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100
76	87	95	100	120	130	144	160	192	200	230	260	288	330	360	410	456	500
1300	1500	1650	1750	2000	2250	2500	2800	3350	3500	4000	4500	5000	5700	6250	7000	7900	8600
10kV																	
120%/1 minute																	
10-stage serial connection, totally 30 power units																	
Three-phase 10kV, 50Hz																	
Single-phase 220V, 50Hz																	
Voltage: ±10% (-10%～-40% for derating), frequency: ±10%																	
4800			5300			7000		8000		10000		13000	14000	15000	17000	18000	20000
30	33.6	37.5	42	48	54	60	67.2	75	84	94.5	106.5	120	135	150	168	189	213
18000					23000			30000				40000			50000		
1120	1250	1400	1600	1800	2000	2240	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100	8000
1120	1250	1400	1600	1800	2000	2240	2500	2800	3150	3550	4000	4500	5000	5600	6300	7100	8000
79	87	92	105	118	131	144	170	184	210	236	260	299	328	367	415	451	500
1500	1650	1750	2000	2250	2500	2800	3250	3500	4000	4500	4950	5700	6250	7000	7900	8600	9550
11kV																	
120%/1 minute																	
10-stage serial connection, totally 30power units																	
Three-phase 11kV, 50Hz																	
Single-phase 220V, 50Hz																	
Voltage: ±10% (-10%～-40% for derating), frequency: ±10%																	
4800			5300			7000			10000			13000	14000	15000	17000	18000	20000
33.6	37.5	42	48	54	60	67.2	75	84	94.5	106.5	120	135	150	168	189	213	240
18000				23000			30000				40000			50000			

※3 The main circuit input voltage of this series could be: three-phase 10kV, 50Hz, corresponding model: SANYUDRIVE-A8S-10-6.6-□kW

Denomination Rules



The DC voltage of SANYUDRIVE-A8S series has a large margin; they are more suitable for the occasions requiring multi-point synchronous drive and the occasions with higher requirements on deceleration time, such as belt conveyor and other types of loads.

General Specification

Harmonic content		Meet the IEEE Std 519-1992,GB/T 14549-93
Input power factor		More than 20% of rated load, 0.95 @ rated load
Efficiency		Inverter efficiency > 98.5%
Control function	Control mode	With a simple speed sensorless vector control V/f constant control
	Output frequency range	0.5～120Hz
	Output frequency resolution	0.01Hz
	Acceleration/deceleration time	0.1s～6500s
	Output dv/dt	≤1000V/μs
	Subsidiary functions	Speed tracking start, instantaneous stop & restart, multi-speed operation, frequency avoidance, alarm reset, PID control (including intelligent PID control), graphical operation, energy-saving operation, low-voltage compensation.
Start/stop setting		Touch screen, control circuit terminals, host communication
Frequency setting	Digital setting	Touch screen, terminal block stepping, host communication
	Analog setting	4-channel: 0~5V/0~10V, 4~20mA
Input signal	Analog	4-channel: 0~5V/0~10V (2-channel), 4~20mA (2-channel)
	Digital	8-channel (definable, scalable with optional PLC) (※1)
Output signal	Analog	4-channel: 0~5V/0~10V (2-channel), 4~20mA (2-channel)
	Digital	10-channel (8-channel relay mode, 2-channel open collector) (※2), Scalable with optional PLC
Host communication		RS485, ModBus, PROFIBUS (option) (select either one according to user demands)
Protective functions		Optical fiber (up, down) protection, IGBT protection, unit over-voltage protection, unit under-voltage protection, unit over-heat protection, unit input open-phase protection, output open-phase protection, transformer over-heat protection, external faulty input protection, over-load protection, under-load protection, door switch protection, DSP1 & DSP2 communication failure protection, overall output over-current protection, overall input over-current protection, closed-loop feedback disconnection protection, output single-phase grounding protection, fan failure protection
Warning functions		Door switch pre-alarm, output current limit, over-load warning, unit over-heat warning, under-load warning, control power switch failure, transformer over-heat warning, output single-phase grounding warning
Display operation		Chinese LCD touch screen, cabinet door button, power indicator
Cooling method		Forced air cooling
IP grade:		IP30
Environment	Ambient temperature	0℃～+40℃
	Storage/transporation temperature	-25℃～+65℃; -25℃～+70℃ Maximum 24 hours
	Vibration	Below 0.1g(9Hz～200Hz)
	Ambient humidity	<90%, non-condensating
	Operating environment	Below 1000m above sea level, indoor (avoid direct sunlight, free of corrosive gas, flammable gas and oil mist), can be used by derating above 1000m

※1: Refer to the number of digital input channels in inverter itself. When users choose the bypass cabinet, due to the demand of control, the number of digital input channels becomes into 7 for the system consisting of bypass cabinet + inverter. When choosing manual bypass cabinet, DI8 is used for the bypass cabinet, please set it as "MBS terminal"; when choosing automatic bypass cabinet, DI5 is used for the bypass cabinet, please set it as "MBS terminal". Refer to Chapter V: Functional Description, Multi-functional Input Terminals for the method of setting;

※2: Refer to the number of relay output channels in inverter itself. When users choose the automatic bypass cabinet, due to the demand of control, the number of relay output channels becomes into 6 for the system consisting of automatic bypass cabinet + inverter. DO5 is used for the bypass cabinet, please set it as "Overall bypass output"; DO6 is used for the bypass cabinet, please set it as "Inverter operating signal". Refer to Chapter V: Functional Description, Multi-functional Input Terminals for the method of setting. For the system consisting of manual bypass cabinet + inverter, the number of relay output channels will remain 8.

Terminal Diagram

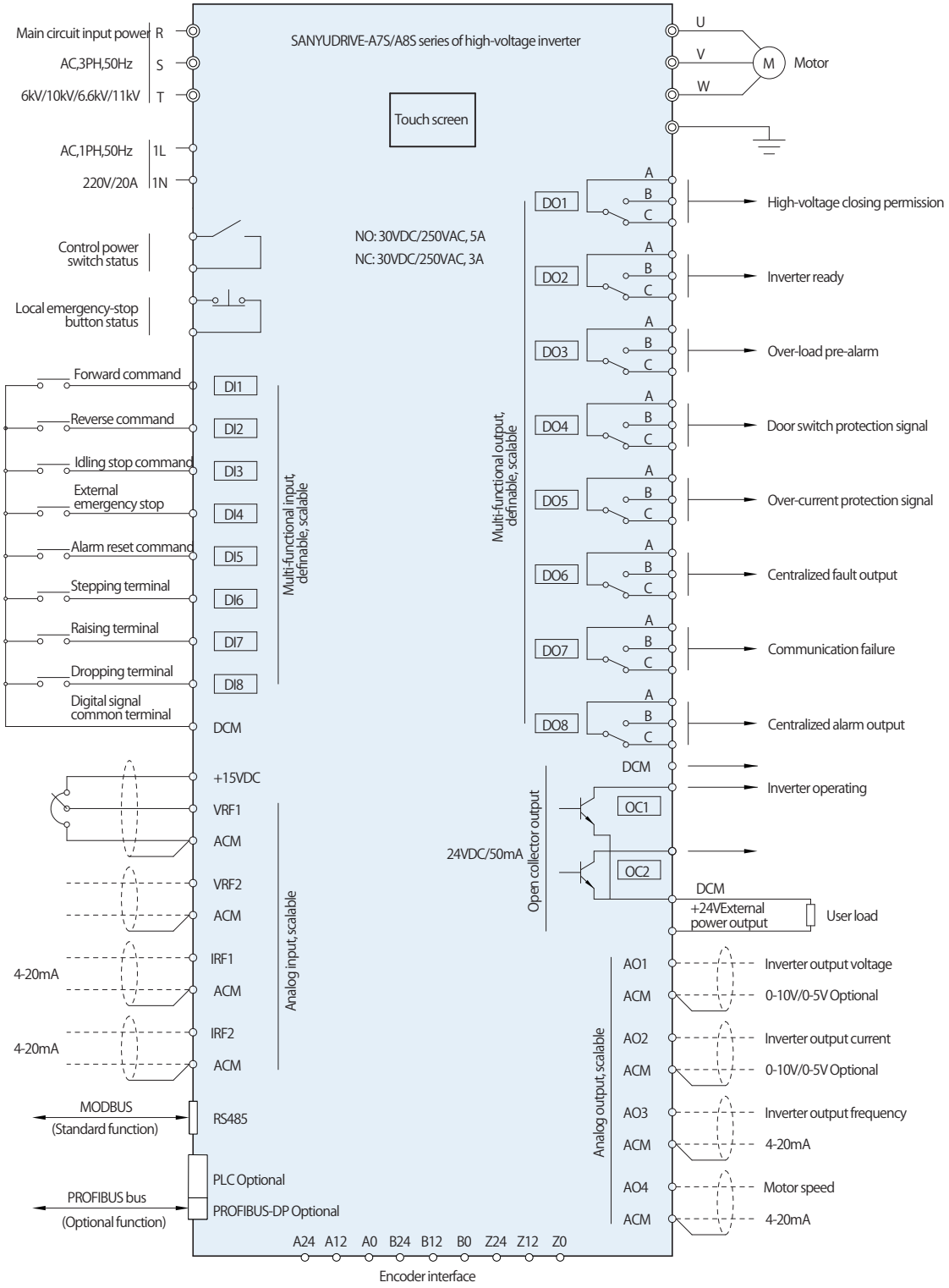


Figure 1

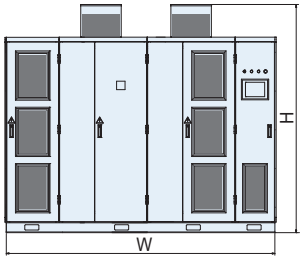


Figure 2

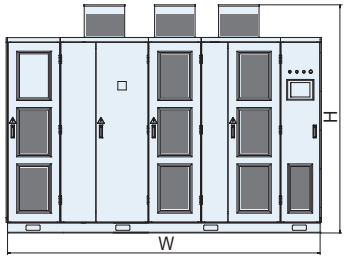


Figure 3

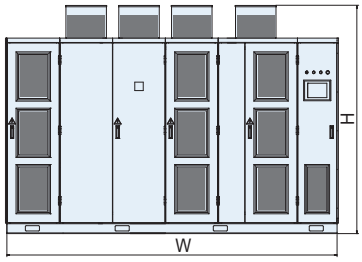


Figure 4

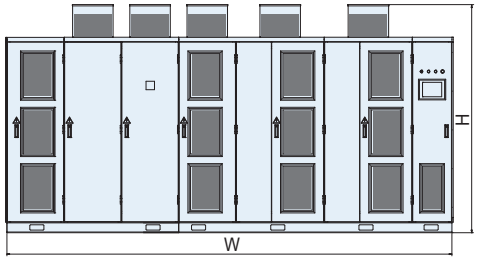


Figure 5

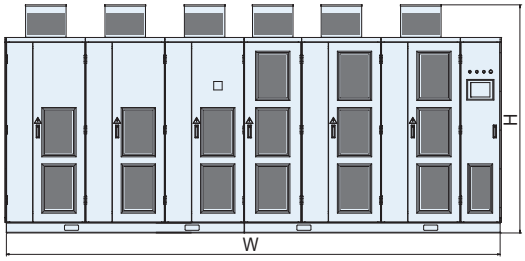


Figure 6

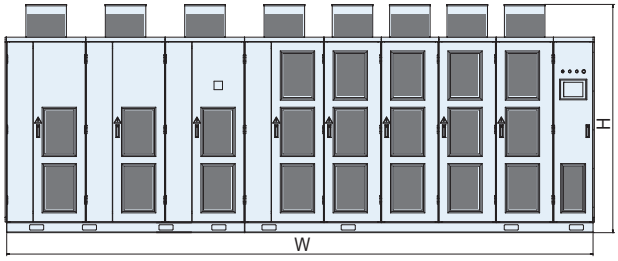


Figure 7

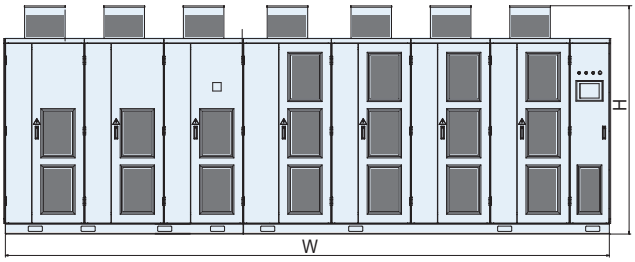
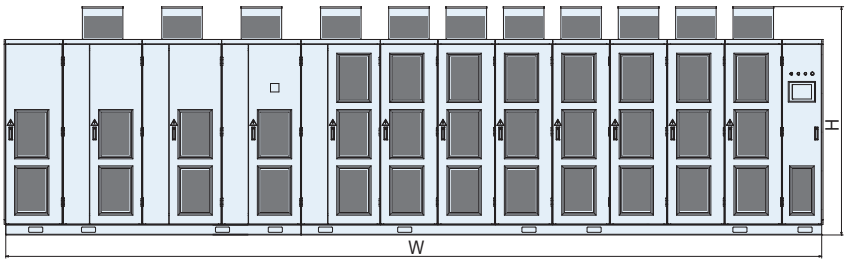
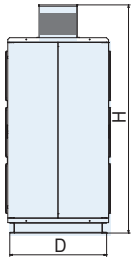


Figure 8



Side View



Overall Dimension

Overall dimension of SANYUDRIVE-A7S&A8S series of high-voltage inverter

<table>
<tr><th rowspan="2">Rated power (kW)</th><th colspan="6">Cabinet dimension (Width W × Height H × Depth D) (mm)</th></tr>
<tr><th>A7S-6-6-□kW</th><th>A7S-10-10-□kW</th><th>A8S-6-6-□kW</th><th>A8S-6.6-6.6-□kW</th><th>A8S-10-10-□kW</th><th>A8S-11-11-□kW</th></tr>
<tr><td>220</td><td rowspan="5">2650×2590×1100
(Figure 1)</td><td rowspan="5">3350×2590×1100
(Figure2)</td><td rowspan="8">3100×2590×1100</td><td rowspan="5">3100×2590×1100</td><td rowspan="8">3750×2590×1100</td><td rowspan="8">3750×2590×1100</td></tr>
<tr><td>250</td></tr>
<tr><td>280</td></tr>
<tr><td>315</td></tr>
<tr><td>355</td></tr>
<tr><td>400</td><td rowspan="3">2750×2590×1100
(Figure 1)</td></tr>
<tr><td>450</td><td rowspan="2">3400×2590×1100
(Figure 2)</td></tr>
<tr><td>500</td><td rowspan="2">3200×2590×1100</td></tr>
<tr><td>560</td><td rowspan="3">2950×2590×1100
(Figure 1)</td><td rowspan="2">3550×2590×1100
(Figure 2)</td><td rowspan="6">3350×2590×1100</td><td rowspan="8">3900×2590×1100</td><td rowspan="8">3900×2590×1100</td></tr>
<tr><td>630</td><td rowspan="5">3350×2590×1100</td></tr>
<tr><td>710</td><td rowspan="2">3600×2590×1100
(Figure 2)</td></tr>
<tr><td>800</td><td rowspan="3">3000×2590×1100
(Figure 1)</td></tr>
<tr><td>900</td><td rowspan="4">3750×2590×1100
(Figure 2)</td><td rowspan="6">3950×2590×1100</td></tr>
<tr><td>1000</td><td rowspan="3">3450×2590×1100</td><td rowspan="6">3950×2590×1100</td></tr>
<tr><td>1120</td><td rowspan="3">3700×2590×1100
(Figure 2)</td><td rowspan="4">3950×2590×1100</td></tr>
<tr><td>1250</td><td rowspan="3">3950×2590×1100</td></tr>
<tr><td>1400</td><td rowspan="2">3900×2590×1100
(Figure 2)</td><td rowspan="3">4100×2590×1100</td></tr>
<tr><td>1600</td><td rowspan="3">4100×2690×1200
(Figure 3)</td><td rowspan="4">4300×2690×1200</td><td rowspan="3">4300×2690×1200</td><td rowspan="3">4100×2590×1100</td></tr>
<tr><td>1800</td><td rowspan="3">4800×2690×1200
(Figure 2)</td><td rowspan="4">5500×2690×1200</td></tr>
<tr><td>2000</td><td rowspan="2">4400×2690×1200</td><td rowspan="4">5500×2690×1200</td></tr>
<tr><td>2240</td><td rowspan="2">4800×2690×1200
(Figure 4)</td><td rowspan="3">5100×2690×1200</td></tr>
<tr><td>2500</td><td>5200×2690×1200(Figure 4)</td><td rowspan="3">5850×2690×1300</td><td>6000×2690×1200</td></tr>
<tr><td>2800</td><td rowspan="2">5550×2690×1200
(Figure 5)</td><td rowspan="2">5950×2690×1200
(Figure 5)</td><td rowspan="2">5850×2690×1200</td><td rowspan="3">6750×2690×1200</td><td rowspan="4">6850×2690×1200</td></tr>
<tr><td>3150</td></tr>
<tr><td>3550</td><td rowspan="3">6750×2690×1300
(Figure 6)</td><td rowspan="4">7400×2690×1300</td></tr>
<tr><td>4000</td><td rowspan="5">7150×2690×1300
(Figure 7)</td><td rowspan="4">7400×2690×1300</td><td rowspan="5">8050×2690×1300</td></tr>
<tr><td>4350</td><td rowspan="4">8050×2690×1300</td></tr>
<tr><td>4500</td><td>—</td><td>—</td></tr>
<tr><td>4800</td><td>—</td><td>—</td></tr>
<tr><td>5000</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>5600</td><td>—</td><td rowspan="3">9500×2690×1300
(Figure 8)</td><td>—</td><td>—</td><td rowspan="3">10800×2690×1300</td><td rowspan="3">10800×2690×1300</td></tr>
<tr><td>6300</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>7100</td><td>—</td><td>—</td><td>—</td></tr>
<tr><td>8000</td><td>—</td><td>—</td><td>—</td><td>—</td><td>—</td><td></td></tr>
</table>

Instructions for model selection

Basic project information	
User/Unit:	
Contact:	
Tel.:	
Project Name:	☐Technical reconstruction ☐New-built

Equipment information	
Load type:	☐Fan ☐Pump ☐Compressor ☐Extruder ☐Multifarious
Grid parameters:	
Grid voltage:	(kV)
Grid voltage fluctuation range:	

Motor parameters	
Motor model:	
Manufacturer:	
Date of manufacture:	
Rated power:	
Rated voltage/current:	(kV) (A)
Rated frequency:	(Hz)
Rated speed:	(r/min)
Power factor:	
Efficiency (%):	
Y/△Connection:	

Environmental conditions	
Indoor temperature:	~ ℃
Relative humidity:	% and below
Altitude:	(m)
Power-frequency bypass cabinet options:	☐Not required ☐Manual switch bypass ☐Automatic vacuum contactor bypass
Local communication type:	☐RS485 ☐Moudus ☐Rrofibus ☐N/A (no communication)
Other special requirements	

More extensive products

Category	Series	Product features	Capacity range (0 / 1 / 4 / 30 / 250 / 5000 / 10000)
Small-sized	 SY6600	Mini-type general purpose inverter ■ The fanless cooling design is suitable for harsh industrial environment ■ Embedded brake unit, facilitating the operation panel lead-out ■ With automatic energy-saving operation, instantaneous stop & restart functions	220V single-phase input: 0.4kW – 2.2kW 400V three-phase input: 0.4kW – 4kW
Middle-sized	 SY8000	Industry-dedicated vector inverter ■ Combined with industrialization, specialization and customization, which can meet the demands of various industries ■ The vector control is featured by fast response, high accuracy and high dynamic performance ■ Superior environmental adaptability, effectively preventing the dust and other foreign matters	400V three-phase input: 0.75kW – 355kW
	 SY8000	High-performance general purpose inverter ■ Speed sensorless vector control function ■ V/f separation and free V/f graphical function ■ A variety of control functions	400V three-phase input: 0.75kW – 355kW
	 SY8000	High-performance vector inverter ■ Advanced high-performance current vector control ■ 32-bit high-speed CPU and LSI response ■ Unique multi-function numerical key operation panel ■ Multi-function dual-relay output	400V three-phase input: 1.5kW – 90kW
	 SY7000	Fan and pump dedicated light-duty inverter ■ Brand-new PID control mode ■ Well-equipped protection and warning functions ■ Perfect energy-saving mode, easy to operate	400V three-phase input: 30kW – 315kW
Large-sized	 SY8600	Large-capacity specialized inverter ■ Compact design, providing the highest power intensity within the industry ■ Strong over-load withstanding ability, easier for the startup of heavy-duty equipment ■ Excellent cooling mode, with superior environmental adaptability ■ Unique semiconductor parallel design, with higher reliability and stability	400V three-phase input: 355kW – 630kW
	 SY8600	Large-capacity parallel specialized inverter ■ Basing on the platform of dual-inverter parallel connection technology, bring excellent solution for the large-power motor drives ■ With superior configurability and programmability ■ Optical fiber communication, response 32Bit DSP high-speed processing ability ■ Enlarge equipment operating space, improve cooling conditions and ensure the smooth equipment running	400V three-phase input: 355kW 630kW
High-voltage	 SANYUDRIVE A7/A7(S)	High-voltage inverter ■ With good versatility, suitable for most applicational occasions ■ With superior reliability and excellent input/output characteristics ■ Automatic energy-saving control, automatic anti-stall function	6kV three-phase input: 220kW – 5600kW 10kV three-phase input: 220kW – 10000kW
	 SANYUDRIVE A8/A8(S)	High-voltage inverter ■ Characterized by heavy load, high torque and constant torsion ■ Wider voltage range ■ Strong over-load withstanding ability, lower harmonic component	6kV three-phase input: 220kW – 5600kW 6.6kV three-phase inpu: 220kW – 6300kW 10kV three-phase input: 220kW – 10000kW 11kV three-phase input: 220kW – 10000kW

Sales Service Contact

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Version Number:KL1-V11EA1-150300MD