Open/Closed Loop Vector Control Model













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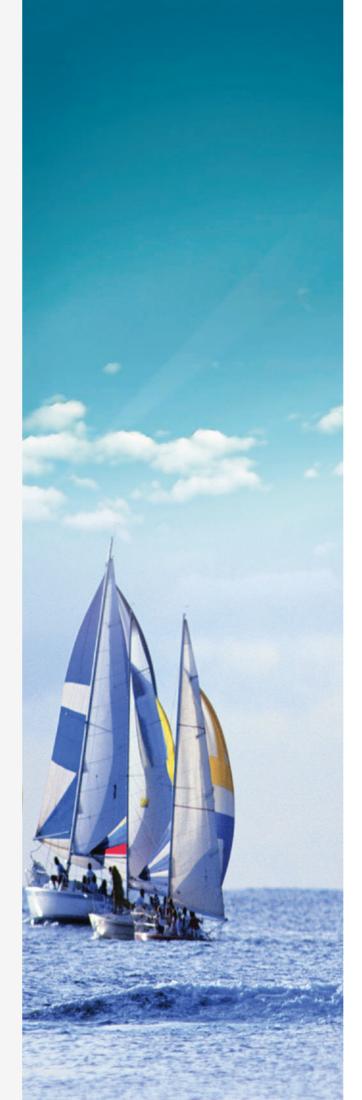


COMPANY PROFILE

SINOVO, established in 2006, is committed to be globally leading provider for products and service of industrial automation and new energy. We are specialized in the products of AC Drive, Electric vehicle motor controller, Solar Inverter, Servo and soft starter, etc, which are widely used in machine tools,textiles, packaging, printing, plastics, paper making, pharmaceuticals, oil field, chemicals, elevator, crane, cables, ceramics, building automation, Fans & Water pumps, vehicles, rail traction and other fileds.

SINOVO has set up more than 30 offices domestically and internationally including 200 employees, and one-third of them are R&D professionals. With 10 years of developing and marketing a consolidated sales and after-sales service network has been established nation widely which can provide customers with solutions, technological training and specialized support and now we are ready to bring our professional products and service to the international market.

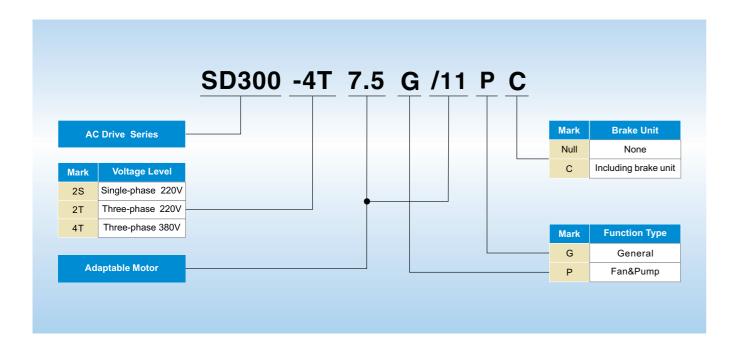
SINOVO has received more than 10 fiscal incentives and policy support in energy saving and environment protection, technology development and advanced manufacturing from Shenzhen Municipal Government and also Baoan administrative District over the years by the virtue of leading capacity of independent innovation, and also registered more than thirty invention patents, utility model patents, appearance patents, and Software copyright patents inSIPO(State Intellectual Property Office). We've passed ISO9001: 2008 quality management system certification, CE certification, awarded the National Innovation Fund, Shenzhen Hightech research subsidies, product Innovation Award and so on. "Innovation" is the soul we strive for, "Customer first, honesty and integrity, hand in hand advance together, win-win cooperation" is the business philosophy we stick in, we are destined to improve ourselves, to serve customers, to contribute society, to build a better earth with our technology strength.



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Naming Rules



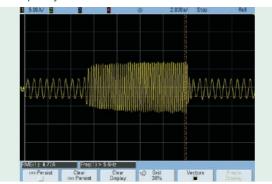
Nameplate



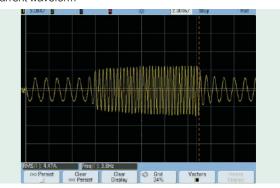
Product Features

Features and Functions

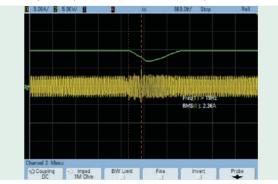
Low frequency and large torque output, VF control mode, under low frequency of 1Hz 150% load current waveform



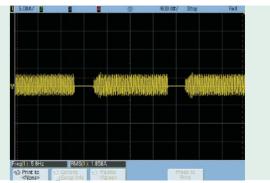
Open-loop vector control mode, under 0.5 Hz 150% load current waveform



Load feedback energy compensates the voltage reduction so that the AC drive can continue to run in a short time in case of power interruption. When the power input normal, it return to normal operation.



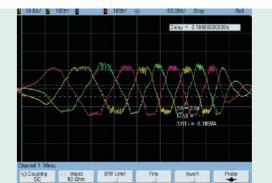
Fast speed tracking start and stop the current waveform, with in 300ms the AC Drive complete the high-speed rotation of the motor shaft speed to achieve rapid smooth start-up.



Fast and effective hardware current limiting technology, when the current of each phase is greater than the limit value during detecting, the logic circuit in the 5uS forced to close the PWM output to complete the wave limit control. The following figure is the motor rotor under high speed

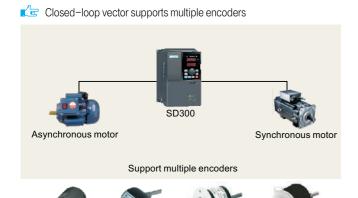


In the following figure, the hardware limits of the motor three-phase current is forced to flow through the inner limit point.



Product Features

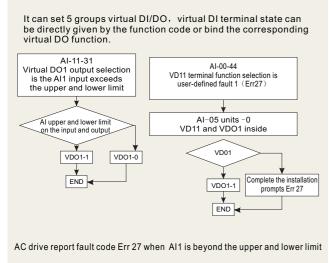
Features and Functions



Differential encoder Open collector encoder UVW encoder Resolver encoder







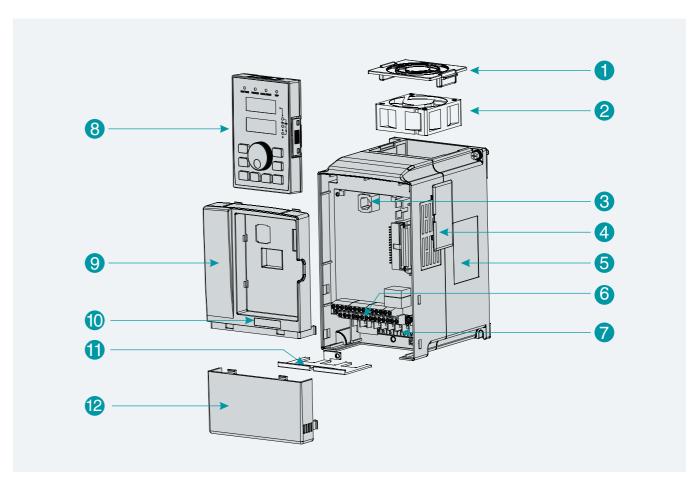


Select input and output expansion card, analog input Al3 can accept motor temperature sensor input (PT100, PT1000). When the motor temperature exceeds the warning value, the AC Drive output pulse signal suggests overheating. When the motor temperature is higher than the overheating protection value, the AC Drive fault output will protect the motor properly.



- → Each analog input (Al1 ~ Al3) can set separately four—point curve and flexible to use;
- → Al1~Al 3 with factory calibration or user-site calibration of linear curves and the accuracy achieves 20mV;
- → AO with factory calibration and user-site calibration of linear curves zero drift and gain and the accuracy achieves 20mV;
- → AI1 ~ AI3 can be used as DI;
- → Al3 is isolate input port, it can be used as PT100 ,PT1000 or 0 ± 10V input port.

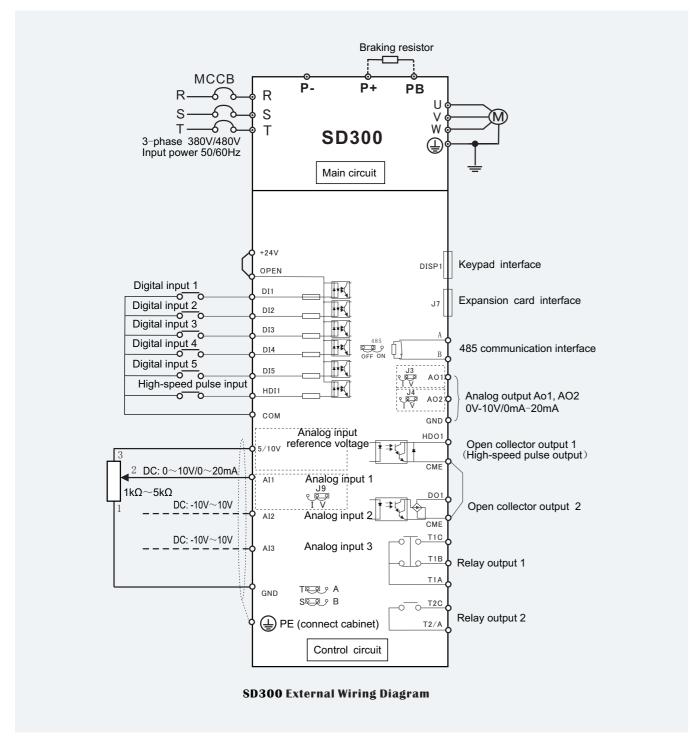
SD300 Structure Diagram



SD300 Product structure diagram (7.5kw,for example)

NO.	Name	Description
1	Fan cover	Protection fan.
2	Cooling fan	See SD300 user manual 8.1 "Definition of Related Terms."
3	Keypad interface	It is used to connect the Keypad.
4	Vents-cover	Optional. with the vents-cover installed, the protection level will increase and the AC drive internal temperature will increase as well so please derating use the AC drive.
5	Nameplate	See SD300 user manual 2.4"Nameplate"
6	Control terminal	See SD300 user manual 3.3"Standard Wiring"
7	Main circuit terminal	See SD300 user manual 3.3"Standard Wiring"
8	Keypad	See SD300 user manual Chapter4 "Operation, Display and Application Examples."
9	Cabinet-cover	Protect the internal components.
10	Series label	See SD300 user manual 2.3 "Naming rules"
11	Apron	Convenience input and output wiring
12	Lower cover	Protect the internal components

Basic Wiring Diagram



O Note:

- 1.SD300 series under 22kw is with standard onboard brake unit and the whole series applies standard RS485 communication
- 2. This figure is Quitable for the machine power level under SD300-4T-18.5G/22P, for other power rate refer to the user manual.

Technical Specification

	Item	Specification							
	Maximum frequency	0~600Hz							
	Carrier frequency	1.0kHz~10kHz; The carrier frequency is automatically adjusted based on the load features.							
	Input frequency resolution	Digital setting: 0.01Hz Analog setting: Maximum frequency x 0.025%							
	Control mode	V/F SVC FVC							
	Startup torque	G Type: 0.5Hz/150% (SVC) 0Hz /180% (FVC) P Type: 0.5Hz/110%							
	Speed range	1:100~SVC~ 1:1000~FVC~							
₽	Speed stability accuracy	+10.5%~SVC~ +10.02%~FVC~							
Basic	Torque control accuracy	+10%~SVC~ +15%~FVC~							
₽.	Overload capacity	G type: 150% rated current for 60s P type: 110% rated current for 60s							
	Torque boost	Auto Torque boost Manual Torque boost 0.1%~20.0%							
∞	V/F curve	Line Multi-point Square V/F curve VF separation							
ě	Accelerate/Decelerate curve	Line or S-curve Acc/Dec mode, four kinds of Acc/Dec time Range of Acc/Dec time 0.0~6000.0s							
===	DC braking	DC braking frequency: 0.00Hz to Maximum frequency / braking time: 0.0 to 100.0s / braking current: 0.0 to 150%							
Ca	Jog control	Jog frequency range: 0.00Hz~Maximum frequency							
Specification	Simple PLC Multi-speed running	16-speed operating through built-in PLC or control terminal							
3	Onboard PID	It realizes process-controlled closed loop control system easily							
	Automatic voltage regulation (AVR)	Jog frequency range:0.00Hz~Maximum frequency							
	Overvoltage/overc- urrent stall control	The current and voltage are limited automatically during the running process so as to avoid frequent tripping due to overvoltage/over-current.							
	Rapid current limit	It helps to avoid frequent over- current faults of the AC drive.							
	Torque control	Open /closed-loop vector model can realize torque control							
	High performance	High-performance current vector control technology to achieve a three-phase AC induction motor control							
_	Non stop Function	Load feedback energy compensates the voltage reduction so that the AC drive can continue to run in a short time in case of power interruption.							
_ =	Speed tracking start	Identify the speed of rapidly rotating motor to realize a smooth start without any rush.							
₽ ₹	Rapid current limiting	Rapid software and hardware current limiting technology helps to avoid frequent over-current fault.							
Individualized Function	Virtual IO	Four sets of virtual Do and five sets of virtual DI enable easy logic control							
	Timing Control	Timing control function: Set the time range: $0.0 \text{Min} \sim 6500.0 \text{Min}$							
n ize	Multi-motor switch	Two independent motor parameters enable two motors switching control							
ž	Bus Support Motor overheating	Two independent MODBUS communication, Profibus-DP Optional IO expansion card 1, analog input T_Motor (Al5)analog input Al3 acceptable the input of motor							
	protection	temperature sensor (PT100、PT1000)							
	Multi-encoder suppor	Support differential, open collector optical encoders, resolvers speed sensor.							
	Command source	Given the control panel, control terminal, serial communication port given. It can be switched by a variety of ways. 11 frequency sources: digital setting, analog voltage setting, analog current setting, pulse setting and serial port. It							
	Frequency source	can be switched by a variety of ways.							
	Auxiliary frequency source	11 auxiliary frequency source. Flexible implementation of auxiliary frequency tuning, frequency synthesis.							
Running	Input terminal	Standard: Six digital input terminals, one of which support to 50kHz high-speed pulse input Three analog input terminals, two of which supports -10V ~ 10V voltage input One support 0 ~ 10V voltage input or 0 ~ 20mA current input Expansion capability: Two digital inputs One analog input terminal, support -10V ~ 10V voltage input, and supports PT100 / Pt1000							
	Output terminal	Standard: One high-speed pulse output terminal (optional open collector type), support of 0 ~ 50kHz square wave signal out One digital output terminals Two relay output terminals Two analog output terminals, support 0 ~ 20mA current output or 0 ~ 10V voltage output Expansion capability: One digital output terminal, one relay output terminal One analog output terminal, support 0 ~ 20mA current output or 0 ~ 10V voltage output							



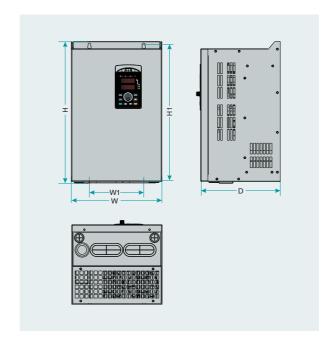
Technical Specification

	Item	Specification						
ہ 🖳	LED display	Display each parameter of function code group						
spla	Key lock and selection function	Achieve some or all of the keys locked and define the scope of partial keys to prevent misuse.						
isplay an operation	Protection function	ered motor short circuit test; Input/output phase failure protection; Over current protection; voltage protection; er voltage protection; Over heat protection; Overload protection; braking resistor fault protection.						
= =	Optional parts	rake unit, Simple IO expansion card, Multi-functional IO expansion card						
_	Installation location	Indoor, free from direct sunlight, dust, corrosive gas, combustible gas, oil smoke, vapour, drip or salt						
F	Altitude	Less than 1000m (derated when use of 1000m~3000m)						
Environment	Ambient temperature	$-10^{\circ}\text{C} \sim +40^{\circ}\text{C}$ (derated when use in ambient temperature of $40^{\circ}\text{C} \sim 50^{\circ}\text{C}$)						
	Humidity	Less than 95%RH, without condensation						
ent	Vibration	Less than 5.9m/s² (0.6g)						
_	Storage temperature	−20°C~+60°C						

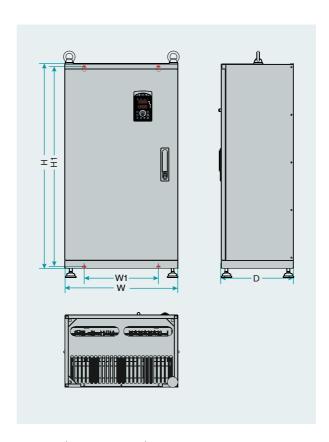
Technical Data

Model Number	Power capacity (KVA)	Input current (A)	Output current (A)	Adaptable Motor(KW)	Model Number	Power capacity (KVA)	Input current (A)	Output current (A)	Adaptable Motor(KW)
		SI	D300-25	: 0.7KW-2.2KW	${\sf Single-phase 220V}$	50/60Hz			
SD300-2S-0.7G	1.5	8.2	4.7	0.75	SD300-2S-2.2G	4.0	23.0	10.0	2.2
SD300-2S-1.5G	3.0	14.0	7.5	1.5					
		S	D300-2T	: 0.7KW-2.2KW	Three-phase220V	50/60Hz			
SD300-2T-0.7G	1.5	5.5	4.7	0.75	SD300-2T-2.2G	4.0	12.0	10.0	2.2
SD300-2T-1.5G	3.0	7.7	7.5	1.5					
		SI	D300-4T	: 0.7KW-500KW	Three-phase 380 V	50/60Hz			
SD300-4T-0.7G	1.5	3.4	2.3	0.75	SD300-4T-90G	134	180	176	90
SD300-4T-1.5G	3.0	5.0	3.7	1.5	SD300-4T-110G	160	214	210	110
SD300-4T-2.2G	4.0	5.8	5.1	2.2	SD300-4T-132G	192	256	253	132
SD300-4T-4.0G	5.9	10.5	8.5	4.0	SD300-4T-160G	231	307	304	160
SD300-4T-5.5G	8.9	14.6	13	5.5	SD300-4T-185G	255	333	330	185
SD300-4T-7.5G	11	20.5	17	7.5	SD300-4T-200G	287	380	377	200
SD300-4T-11G	17	26	25	11	SD300-4T-220G	311	429	426	220
SD300-4T-15G	21	35	32	15	SD300-4T-250G	355	470	465	250
SD300-4T-18.5G	24	38.5	37	18.5	SD300-4T-280G	396	525	520	280
SD300-4T-22G	30	46.5	45	22	SD300-4T-315G	439	605	600	315
SD300-4T-30G	40	62.5	60	30	SD300-4T-350G	479	665	660	355
SD300-4T-37G	57	76	75	37	SD300-4T-400G	530	730	725	400
SD300-4T-45G	69	92	91	45	SD300-4T-450G	600	825	820	450
SD300-4T-55G	85	113	112	55	SD300-4T-500G	660	910	900	500
SD300-4T-75G	114	157	150	75					

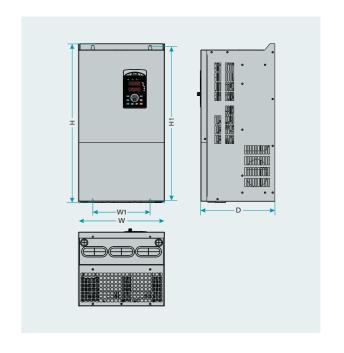
SD300 Outline Diagram



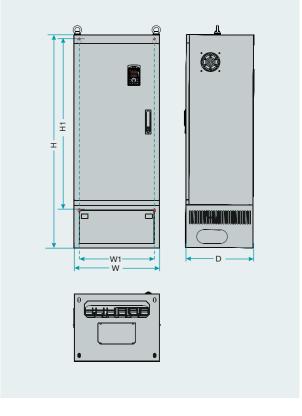
SD300(11KW-45KW)outline and installing dimension



SD300(132KW-185KW)outline and installing dimension



SD300(55KW-110KW) outline and installing dimension



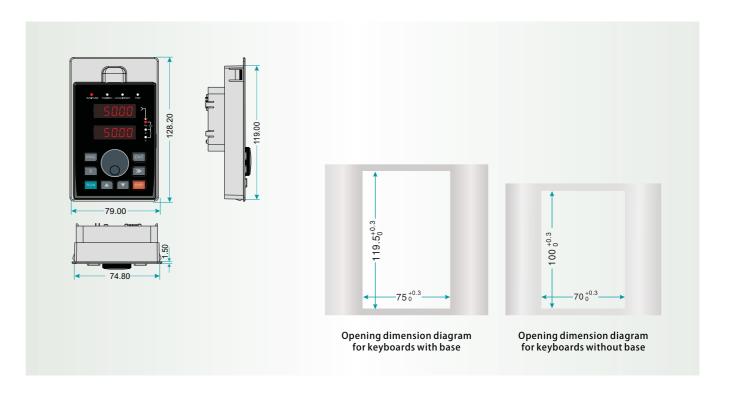
SD300(200KW-500KW)outline and installing dimension

Installation Size

Model Number	H(mm)	W(mm)	D(mm)	H1(mm)	W1(mm)	Bore(mm)	G.W(kg)
		SD300-2S:0	Sigle-phase 220)V			
SD300-2S-0.7G	190	110	150	178	98	Ф5	2.4
SD300-2S-1.5G	190	110	150	178	98	Ф5	2.4
SD300-2S-2.2G	190	110	150	178	98	Ф5	2.4
		SD300-2T:0	.7KW-2.2KW	Three-phase 22	0V		
SD300-2T-0.7G	190	110	150	178	98	Ф5	2.4
SD300-2T-1.5G	190	110	150	178	98	Ф5	2.4
SD300-2T-2.2G	190	110	150	178	98	Ф5	2.4
		SD300-4T:0.	7KW-500KW	Three-phase 38	80V		
SD300-4T0.7G	190	110	150	178	98	Ф5	2.4
SD300-4T-1.5G	190	110	150	178	98	Ф5	2.4
SD300-4T-2.2G	190	110	150	178	98	Ф5	2.4
SD300-4T-4.0G	210	130	160	198	118	Ф5	3.5
SD300-4T-5.5G	250	155	176	236	141	Ф5	4.5
SD300-4T-7.5G	250	155	176	236	141	Ф5	4.5
SD300-4T-11G	285	170	162	270	135	Ф6	5.1
SD300-4T-15G	332	220	214	318	140	Φ	9.3
SD300-4T-18.5G	332	220	214	318	140	Ф7	9.3
SD300-4T-22G	387	250	220	373	150	Ф7	14
SD300-4T-30G	387	250	220	373	150	Ф7	19
SD300-4T-37G	440	270	252	426	180	Ф7	25
SD300-4T-45G	440	270	252	426	180	Ф7	25
SD300-4T-55G	550	300	258	534	200	Ф9	48
SD300-4T-75G	650	370	282	625	250	Ф9	52
SD300-4T-90G	650	370	282	625	250	Ф9	55
SD300-4T-110G	650	370	282	625	250	Ф9	90
SD300-4T-132G	880	485	310	860	320	Ф13	99
SD300-4T-160G	880	485	310	860	320	Ф13	99
SD300-4T-185G	880	485	310	860	320	Ф13	99
SD300-4T-200G	1250	500	400	1000	440	Ф13	167
SD300-4T-220G	1250	500	400	1000	440	Ф13	167
SD300-4T-250G	1250	500	400	1000	440	Ф13	167
SD300-4T-280G	1350	650	400	1105	513	Ф13	206
SD300-4T-315G	1350	650	400	1105	513	Ф13	206
SD300-4T-350G	1350	650	400	1105	513	Ф13	206
SD300-4T-400G	1810	850	405	1410	513	Ф13	415
SD300-4T-450G	1810	850	405	1410	513	Ф13	415
SD300-4T-500G	1810	850	405	1410	513	Ф13	415

Above dimensions is only for reference. Instructions are subject to change without notice. For more information, please contact SINOVO.

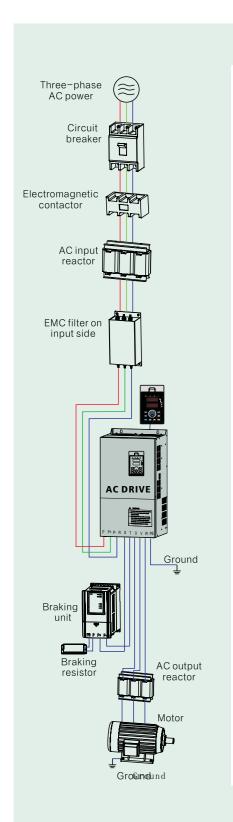
Keyboard/Accessory



Optional Accessory

Name	Туре	Function	Remark
Internal braking unit	Models followed by letter "C"	Models power under 22KW are installed with the internal braking unit as standard configuration.	For 30KW model power, the braking unit is optional
External braking unit	SDBUN	37KW and above need to be configured with an external braking unit.	Multiple braking units are connected In parallel for the models above 90KW.
Multi-function I / O expansion card	SD300IO1	Increase 3 digital inputs, 2 digital outputs, two relay outputs, two analog voltage input T_Motor.	It applies to all models.
Modbus communication card	SD300CM1	One RS - 485 communication card, one CAN communication card.	Coming soon
Profibus-DP card	SD300DP	Profibus-DP card, DB9interface	Coming soon
Differential encoder interface card	SD300PG1	It is the differential resolver interfacecard.It is adaptable to 5 V power supply.	It applies to all models.
Resolver Interface Card	SD300PG2	It is applied to the resolver.10 kHz excitation frequency, Db9 interface	It applies to all models.
Open collector encoder interface card	SD300PG3	An open-collector encoder interface card	It applies to all models.
External LCD panel	SD300LCD	External LCD display and keypad, you supply copy parameters	Coming soon

Peripheral Equipment



Name	Mounting Location	Function Description
МССВ	Power receiving side	◆ Interrupt the power supply when over- current occurs on downstream devices
Contactor	Between MCCB and AC drive input side	♦ Start and stop the AC drive. Do not start and stop the AC drive frequently by switching the contactor on and off (less than twice per minute) noruse it to directly start the inverter.
AC input reactor	AC drive input side	 ◆ Improve the power factor of the input side. ◆ Eliminate the higher harmonics of the input side effectively and prevent other devices from being damaged due to distortion of the voltage waveform. ◆ Eliminate the input current unbalancedue to that between the power phases.
EMC Input filter	AC driver input side	 ◆ Reduce the external conduction and radiation interference of the inverter. ◆ Decrease the conduction interference flowing from the power end to the inverterand improve the anti interference capacity of the AC drive.
DC reactor	SD300 series AC drive under 30G configured with DC reactor as standard	 ♦ Improve the power factor of the input side. ♦ Improve the efficiency and thermal stability of the AC drive. ♦ Eliminate the impact of higher harmonics of AC drive input side and reduce the external conduction and radiation interference
AC output reactor	Between AC drive output side and the motor, close to the inverter	◆ The output side of the AC drive generally has much higher harmonics. When the motor is far from the AC drive, there is much distributed capacitance in the circuit and certain harmonics may cause resonance in the circuit, bringing about the following two impacts: a) Degrade the motor insulation performance and damage the motor in the long run. b) Generate large leakage current and cause frequent AC drive protection trips. ◆ If the distance between the inverter and the motor is greater than 100 m, install an AC output reactor.

Braking Unit Recommendation

Selection of value resistance

The motor and load's regenerative energy is almost completely consumed on the braking resistor when braking. According to the formula:

U*U/R=Pb

U----Braking voltage at stable braking system. System selections differs in braking voltages, The AC380Vsystem usually selectsDC700V braking voltage.)

Pb----Braking power

Selection of Braking Resistance Power

Theoretically braking resistance of power and braking power is consistent, but considering the derating 70%. According to the formula:

0.7*Pr=Pb*D

Pr---Resistor power

D----Braking frequency (The reproduction process accounts for the proportion of the entireworking process)

Elevator---20%~30%

Open and draw volume---20%~30%

Centrifuge---50%~60%

Accidental braking load---5% Commonly take 10%

SD300 series AC Drive braking unit selection table

AC Drive Capacity	Brakir	ıg Unit	Braking resistance		
(KW)	Specification	Q.T.Y unit	Recommended Resistance	Recommended Power	Q.T.Y unit
0.75		1	≥300Ω	150W	1
1.5		1	≥220Ω	150W	1
2.2		1	≥200Ω	250W	1
4.0		1	≥130Ω	300W	1
5.5		1	≥90Ω	400W	1
7.5	Standard onboard	1	≥65Ω	500W	1
11		1	≥40Ω	800W	1
15		1	≥32Ω	1000W	1
18.5		1	≥25Ω	1300W	1
22		1	≥22Ω	1500W	1
30		1	≥16Ω	2500W	1
37		1	≥16Ω	3700W	1
45		1	≥16Ω	4500W	1
55		1	≥8Ω	5500W	1
75		2	≥8Ω	3700W	2
90		2	≥8Ω	4500W	2
110	EHBU70	2	≥8Ω	5500W	2
132		3	≥8Ω	3700W	3
160		3	≥8Ω	5500W	3
185		4	≥8Ω	4500W	4
200		4	≥8Ω	5500W	4
220		4	≥8Ω	5500W	4