

# DA300

Intelligent AC Servo System



CE

**inv**t



## Product Introduction

DA300 series products are new-generation intelligent servo systems developed by INVT. DA300 is high-speed, high-precision, high-efficiency, high cost-effectiveness, and intelligent option for industrial motion control devices. With the excellent driving performance, DA300 can help the equipment manufacturing industry to improve their value and efficiency. DA300 series products are widely applied to general-purpose devices, including robots, electronic devices, machine tools, laser equipment, printing and packaging devices, battery equipment, woodworking machinery, warehousing and transport tools, rubber and plastics machinery, and textile machinery.

## Features

- **Quick response**  
Response frequency of 3.0 kHz.
- **High-precision control**  
Standard multi-23bit ABS encoder.
- **More abundant communication interfaces**  
Support bus communication protocols including Modbus, CANopen, EtherCAT.
- **More built-in hardware protection**
- **More motor and encoder protocols**  
Support rotary motors, linear motors, DD motors, and third-party motors; Supporting absolute encoders as the second encoder.
- **Light and compacted structure**  
Designed in the integrated structure, significantly reduces the volume (compared to the single-axis machine)

## Guide for model selection

### SV-DA300-OR4-2-E 0-XXXX

①      ②      ③      ④   ⑤ ⑥      ⑦

Symbol	Number	Instruction	Naming instance
SV	①	Product category	SV: Servo system product
DA300	②	Product series	DA300: Servo driver
OR4	③	Power class	OR1: 100W
			OR2: 200W
			OR4: 400W
			OR7: 750W
			1R0: 1.0kW
			1R5: 1.5kW
			2R0: 2.0kW
2	④	Input voltage class	2: 220VAC 4: 400VAC
E	⑤	Servo type	E: Pulse type
			S: Standard
0	⑥	Encoder type	N: EtherCAT bus type
			0: Photoelectric encoder
XXXX	⑦	Lot no.	Manufacturer lot no. used for differentiating models with special functions. Lot no. is the default one.

## Different functions in different machine types

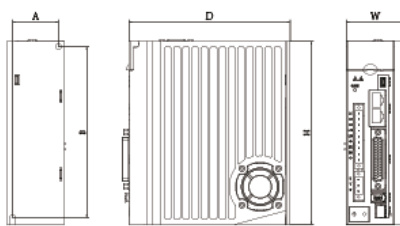
Driver type	Symbol	Pulse input	16-bit analog input	Second encoder	STO	RS485	CANopen	EtherCAT	Photoelectric encoder
Pulse type	E0	√	X	√	√	√	X	X	√
Standard type	S0	√	√	√	√	√	√	X	√
Bus type	N0	X	X	√	√	X	X	√	√

Note: "√" indicates that this feature is available.  
 "x" indicates that this feature is not available.

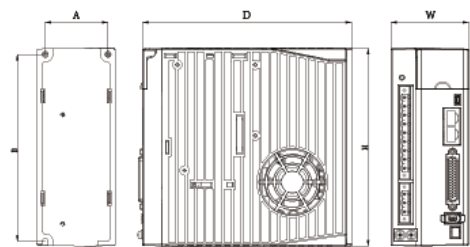
## Servo drive model specification

Drive model	Input		Output		Case size
	Voltage (V)	Rated current (A)	Power (kW)	Rated current (A)	
SV-DA300-0R1-2	1PH/3PH 220	0.9/0.4	0.1	1.3	A
SV-DA300-0R2-2	1PH/3PH 220	1.8/0.8	0.2	1.8	A
SV-DA300-0R4-2	1PH/3PH 220	3.6/1.5	0.4	2.8	A
SV-DA300-0R7-2	1PH/3PH 220	6.8/2.8	0.75	5.2	B
SV-DA300-1R0-2	1PH/3PH 220	9.1/3.7	1.0	6	B
SV-DA300-1R5-2	3PH 220	5.6	1.5	7.6	C
SV-DA300-2R0-2	3PH 220	7.5	2	10	C

## Driver size



Volume diagram A,B



Volume diagram C

Drive volume	Drive model	Built-in brake resistance specification			Min. resistance value of an external brake resistance		Diameter of the mounting hole (mm)
		H(mm)	W(mm)	D(mm)	A(mm)	B(mm)	
A	SV-DA300-0R1-2	160	42	141	32	150	M4(Φ5)
	SV-DA300-0R2-2						
	SV-DA300-0R4-2						
B	SV-DA300-0R7-2	160	50	141	40	150	M4(Φ5)
	SV-DA300-1R0-2						
C	SV-DA300-1R5-2	170	67	180	54	162	M4(Φ5)
	SV-DA300-2R0-2						

## Brake resistance specification

Drive model	Built-in brake resistance specification	Min. resistance value of an external brake resistance
SV-DA300-0R1-2	/	60Ω
SV-DA300-0R2-2	/	60Ω
SV-DA300-0R4-2	/	60Ω
SV-DA300-0R7-2	45Ω/60W	45Ω
SV-DA300-1R0-2	45Ω/60W	45Ω
SV-DA300-1R5-2	30Ω/60W	20Ω
SV-DA300-2R0-2	35Ω/60W	20Ω

## EMI filter selection table

Drive model	EMI filter model
SV-DA300-0R1-2	FLT-P04006L-B
SV-DA300-0R2-2	
SV-DA300-0R4-2	
SV-DA300-0R7-2	
SV-DA300-1R0-2	FLT-P04006L-B
SV-DA300-1R5-4	
SV-DA300-2R0-2	

Note: "/" means there's no built-in resistor.

## Technical parameters of servo drive

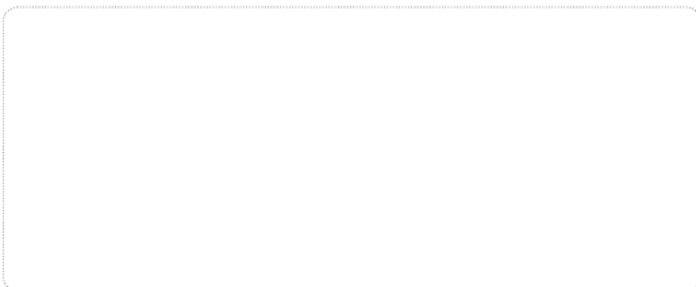
DA300 Series servo drive(100W~2kW)			
Specification		Instruction	
power	220Vsystem input voltage	1P/3P、AC220V~240V、-15%~+15%、47Hz~63Hz	
Port	Control signal	Input	8 inputs for standard type, pulse type and CANopen bus type; 7 inputs for EtherCAT bus type; (functions can be configured via relevant parameters)
		Output	6 outputs for standard type, pulse type and CANopen bus type; 4 outputs for EtherCAT bus type; (functions can be configured via relevant parameters)
	Analog	Input	2 inputs for standard type (1 12bit, 1 16bit analog input) 2 input for non-standard type (2 12bit analog inputs)
		Output	2 outputs (analog monitoring output)
	Pulse signal	Input	1 input (mode: differential input or open collector)
		Output	1 output (mode:differential output (A+, A-; B+, B-; Z+, Z-))
	2nd encoder	Input	Incremental encoder interface (2nd encoder or linear encoder) \ SCI
	communication	USB	1:1communication upper PC software (standard)
		RS485	1:ncommunication (standard)
		CANopen	1:ncommunication (optional)
Safety terminal	STO	1:ncommunication (optional)	
Control mode		1、 Position control; 2、 Speed control; 3、 Torque control; 4、 Position/speed mode switching; 5、 Speed/torque mode switching; 6、 Position/torque mode switching; 7、 Fully-closed loop control; 8、 CANopen mode; 9、 EtherCAT mode	
Function	Position control	Control input	1、 Retaining pulse zeroing; 2、 Command pulse input disabled; 3、 Electronic gear ratio switching; 4、 Vibration control switching,etc.
		Control output	Position complete output,etc
	Pulse input	Max.pulse input frequency	Photoelectric coupling: differential input 4Mpps, open collector input 200kpps
		Pulse input mode	1、 Pulse+direction; 2、 CW+CCW; 3、 Quadrature encoding
		Electronic gear	1/10000~1000 times
	Analog input	Filter	1、 Command smooth filter; 2、 FIRfilter
		Torque limitation	Can perform clockwise/anticlockwise torque limit separately
Vibration control	Can control 5~200Hz front-end vibration and machine vibration		
Pulse output	1、 Can perform any frequency division setting which is below encoder resolution rate; 2、 B Phase reversing function		



## Technical parameters of servo drive

DA300 Series servo drive(100W-2kW)					
Specification		Instruction			
Function	Speed control	Control input	1. Internal command speed selection 1; 2. Internal command speed selection 2; 3. Internal command speed selection 3; 4. Zero speed clamp		
		Control output	Speed reaching,etc		
		Analog input	Speed command input	Can set to speed command input based on analog voltage DC±10V	
			Torque limit input	Can carry out torque limit clockwise/anticlockwise separately	
		Internal speed command	Can switch between internal 8-step speed based on external input control		
		Speed command Acc/dec adjustment	Can set acc/dec time separately or set acc/dec of S curve		
		Zero speed clamp	In speed mode, zero speed clamp function can set to work in speed mode or position mode		
	Speed command zero drift control	Can carry out zero drift control against peripheral disturbance, precision 0.3mV			
	Torque control	Control input	Zero speed clamp input, etc.		
		Control output	Speed reaching,etc.		
		Analog input	Torque command input	Analog torque command input, can set gain and polarity based on analog voltage,precision 4.88mV	
			Speed limit input	Can carry out analog speed limit	
		Speed limit	Speed limit can be set via parameters		
		Torque command filter	First-order delay filter of analog input torque command		
		Torque command zero drift control	Can carry out zero drift control against peripheral disturbance,precision 4.88mV		
	Internal position planning	Plan points	Can carry out 128-point internal position plan setting,support communication control positioning		
		Route setting	1. Position; 2. Speed; 3. ACC time; 4. Dec time; 5. Stop timer; 6. Various state output; 7. Running mode		
		Homing	1. LS signal; 2. Z phase signal; 3. LS signal + phase signal; 4. Torque limit signal		
	protection	Hardware protection		Overvoltage,undervoltage,overcurrent,overspeed,overload,overheat,brake resistor overload,encoder fault,etc.	
		Software protection		Storage fault,initialization fault, I/O distribution error,position deviation is too large,etc.	
		Protection and fault record		1. Can record up to 10 faults; 2. Can record the key parameter value when fault occurred	
Environment	Temperature	Working temp	0~45℃		
		Storage temp	-20~80℃(Non frozen)		
	Working / storage RH		≤90%RH (no condensation)		
	IP level		IP20		
	Elevation		Below1000m		
	Vibration		≤5.88m/s <sup>2</sup> , 10~60Hz (Do not work on resonance point)		

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|-------------------------------|--|---------------------------------------|----------------------------|-----------------------------------|
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|                               | • HMI  | • Intelligent Elevator Control System | • Traction Drive           |                                   |
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