

# DA180 Series

Basic AC Servo Drive



## Introduction

DA180 series basic AC servo drive is the new generation of INVT simplified single-axis servo product.

Utility oriented, DA180 focuses on the essential of manufacturing, achieving quick need response and making expansion easy.

It provides efficient and competitive solutions for the intelligentization, simplification, networking, and high-performance requirements of general-purpose equipment.



## Features



**High speed response**(up to 2.0kHz)



**Light and handy**

Compared with DA200, DA180 can maximum reduce the size by 45%



**Accurate positioning**

17-bit absolute encoder



**Enriched communication interfaces**

Support CANopen and Modbus fieldbus



**Environmental adaptability**

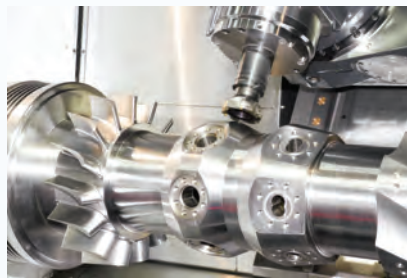
Models( $\leq 400\text{W}$ ) adapts natural cooling



**Low frequency vibration control**

Effectively suppresses low frequency mechanical resonance and long swing-arm end oscillation, boosts the rotation efficiency and speeding up operation

## Applications



## Model Selection

# DA180 - S 2R2 S G 0

①

②

③

④

⑤

⑥

Symbol	No.	Item	Description
DA180	①	Product category	DA180: Servo drive series
S	②	Voltage class	S: 220V
2R8	③	Rated output current	1R3: 1.3A 1R8: 1.8A 2R8: 2.8A 4R5: 4.5A 5R0: 5.0A
S	④	Communication type	S: Supporting RS485 and optional CAN
G	⑤	Function type	G: Basic type
0	⑥	Encoder type	0: Absolute

## Power Ratings

Drive model	Input		Output		Frame size
	Voltage (V)	Rated current (A)	Power (kW)	Rated power (A)	
DA180-S1R3SG0	1PH 220V	0.9	0.1	1.3	A
DA180-S1R8SG0	1PH 220V	1.8	0.2	1.8	A
DA180-S2R8SG0	1PH 220V	3.6	0.4	2.8	A
DA180-S4R5SG0	1PH 220V	6.8	0.75	4.5	B
DA180-S5R0SG0	1PH 220V	9.1	1.0	5	B

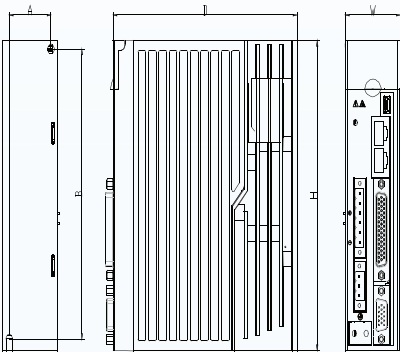
## Brake Resistor

Drive model	Built-in brake resistor specifications	Min. allowed resistance of external brake resistor
DA180-S1R3SG0	/	60Ω
DA180-S1R8SG0	/	60Ω
DA180-S2R8SG0	/	60Ω
DA180-S4R5SG0	45Ω/60W	45Ω
DA180-S5R0SG0	45Ω/60W	45Ω

## EMI Filter

Drive model	EMI filter model
DA180-S1R3SG0	FLT-P04006L-B
DA180-S1R8SG0	
DA180-S2R8SG0	
DA180-S4R5SG0	FLT-P04016L-B
DA180-S5R0SG0	

## Servo Drive Sizes



Frame	Drive model	Outline dimensions			Installation dimensions		Installation hole
		H	W	D	A	B	
A	DA180-S1R3SG0	160	42	141	32	150	M4(Φ5)
	DA180-S1R8SG0						
	DA180-S2R8SG0						
B	DA180-S4R5SG0	160	50	141	40	150	M4(Φ5)
	DA180-S5R0SG0						

unit:mm

## Servo Drive Technical Parameters

DA180 series servo drive					
Specifications			Description		
Power	220V system input voltage		1PH, AC 220V(±15%), 47-63Hz		
Port	Control signal	Input	Ten channels of input (the functions can be set through related parameters)		
		Output	Four channels of output (the functions can be set through related parameters)		
	Analog	Input	Two channels of 12-bit analog input		
	Pulse signal	Input	One group of input (in differential or open collector mode)		
		Output	One group of output (in differential mode, A+, A-; B+, B-; Z+, Z-)		
	Communication	USB	1:1 communication upper PC software		
		RS485	1:n communication		
	CANopen	1:n communication (optional configuration)			
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. CANopen mode;		
Function	Position control	Control input	1. Residual pulse clearing;    2. Command pulse input disabling; 3. Electronic gear ratio switching;    4. Vibration control switching		
		Control output	Such as positioning completion output		
		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	
		Filter	1. Command smoothing filter;    2. FIR filter		
		Analog input	Torque limit input	Able to perform clockwise/anticlockwise torque limit separately	
		Vibration control	Able to control 5~200Hz front-end vibration and overall vibration		
	Pulse output	1. Able to perform any frequency division setting below the encoder resolution 2. Capable of the B-phase reversing function			
	Speed control	Input control	1. Internal command speed selection 1; 2. Internal command speed selection 2; 3. Internal command speed selection 3; 4. Zero speed clamping		
		Output control	Such as speed reaching		
		Analog input	Speed command input	Able to enable speed command input after related settings are made based on analog voltage DC±10V	
			Torque limit input	Able to enable separate clockwise/anticlockwise torque limit	
		Internal speed command	Able to switch between internal 8-step speeds based on external input control		
		Speed command ACC/Dec adjustment	Able to set ACC/Dec time separately or make S-curve ACC/Dec settings		
		Zero speed clamping	Delay filter for analog input speed commands		
		Speed command filter	Able to perform zero drift control on external interference		
	Torque control	Input control	Such as zero speed clamping input		
		Output control	Such as speed reaching		
		Analog input	Torque command input	Support for gain and polarity settings based on analog voltage	
			Speed limit input	Support for analog speed limit	
		Speed limit	Able to set speed limit through parameters		

## Servo Drive Technical Parameters

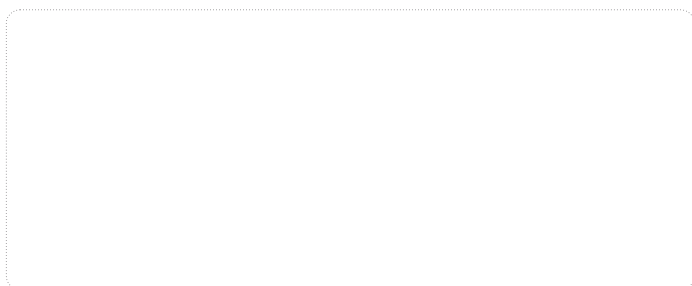
DA180 series servo drive			
Specifications			Description
Function	Torque control	Torque command filter	Delay filter for analog input torque commands
		Torque command zero drift control	Able to perform zero drift control on external interference
	Internal position planning	Point planning	Support for 128-segment internal position setting and communication-controlled 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 + Z-phase signal; 4. Torque limit signal;	
Protection	Hardware protection		Protection against faults such as overvoltage, undervoltage, overcurrent, overspeed, overload, brake resistor overload, and encoder fault Such as protection against ROM fault, initialization fault, I/O distribution exception, drive overheating, and excessive position deviation
	Fault records		1. A total of ten faults can be recorded. 2. Key parameters can be recorded when a fault occurs.
Environment	Temperature	Working temperature	0–45°C
		Storage temperature	-20–80°C (no freezing)
	Working/storage RH		≤90% RH (no condensation)
	IP rating		IP20
	Altitude		Below 1000 meters
Vibration		≤5.88m/s <sup>2</sup> , 10–60Hz (Do not work at the resonance point)	

## Servo Motor Technical Parameters

Motor model (17-bit single-turn magnetic encoder)	Rated power (kW)	Rated current (A)	Max. momentary current (A)	Rated torque (Nm)	Max. momentary torque (Nm)	Rated speed (rpm)	Max. speed (rpm)	Rotation inertia without/with Electromagnetic brake(kg.cm <sup>2</sup> )	Voltage (V)	Weight without/with Electromagnetic brake (kg)
ML series with small inertia										
SV-ML06-0R2G-2-SA□	0.2	1.5	4.5	0.64	1.92	3000	5000	0.198/0.21	220	1.4/1.6
SV-ML06-0R4G-2-SA□	0.4	2.8	8.4	1.3	3.9			0.33/0.34		1.8/2.0
SV-ML08-0R7G-2-SA□	0.75	4.5	13.5	2.4	7.2			1.28/1.41		3.0/3.5
MM/SM series with medium inertia										
SV-MM13-1R0E-2-SA□	1	4.8	14.4	4.78	14.3	2000	2750	6.4/7.19	220	5.8/7.5
Insulation class	Class F (155°C)									
IP rating	IP65									
Ambient environment	Temperature: -20°C ~ +40°C (no freezing); RH: Below 90%RH (no condensation)									



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|-------------------------------|--|---------------------------------------|----------------------------|-----------------------------------|
| <b>Industrial Automation:</b> | • Frequency AC Drive                         | • Servo & Motion Control              | • Motor & Electric Spindle | • PLC                             |
|                               | • HMI  | • Intelligent Elevator Control System | • Traction Drive           |                                   |
| <b>Electric Power:</b>        | • SVG  | • Solar Pump Controller               | • UPS                      | • Online Energy Management System |
|                               | • New Energy Vehicle Electric Control System |                                       |                            |                                   |

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