

**Title:** Sigma-7 Gearmotor Temperature Test Data

**Product(s):** S7A, S7J, S7G, and S7P Gearmotors

**Doc. No.** PN.GearMotors.01

Servomotor continuous output torque ratings are dependent ambient temperature and the heat transfer characteristics of the components and structure the servomotor is connected to. Mounting a servomotor to a gearhead affects the heat transfer characteristics of the system with a corresponding change to the continuous output torque rating.

The following continuous output torque test values have been experimentally determined through dynamometer testing. The continuous output torque of the gearmotor combination is shown in the following tables. The peak torque is unaffected by the heat transfer characteristics of the motor and gearbox combination.

If gearmotor operating temperatures are too high, implement the following measures:

- Decrease the load.
- Adjust the motion profile to reduce acceleration and/or duty cycle
- Change the heat dissipation conditions.
- Use forced-air cooling for the motor with a cooling fan or other means.
- Select a gearmotor with a larger continuous output torque rating.

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**S7A Gearmotors**

Gearmotor Model Number	Continuous Torque (%)	Comments
S7A01A-VL050-03	75%	
S7A01A-VL050-05	75%	
S7A01A-VL050-10	75%	
S7A01A-VL050-25	70%	
S7A01A-VL070-50	70%	
S7A01AC-VL050-03	75%	
S7A01AC-VL050-05	75%	
S7A01AC-VL050-10	75%	
S7A01AC-VL050-25	70%	
S7A01AC-VL070-50	70%	
S7A02A-VL050-03	75%	
S7A02A-VL050-05	75%	
S7A02A-VL070-10	75%	
S7A02A-VL070-25	70%	
S7A02A-VL070-50	70%	
S7A02AC-VL050-03	75%	
S7A02AC-VL050-05	75%	
S7A02AC-VL070-10	75%	
S7A02AC-VL070-25	70%	
S7A02AC-VL070-50	70%	
S7A04A-VL050-03	62%	
S7A04A-VL050-05	62%	
S7A04A-VL070-10	62%	
S7A04A-VL070-25	60%	
S7A04A-VL090-50	60%	
S7A04AC-VL050-03	62%	
S7A04AC-VL050-05	62%	
S7A04AC-VL070-10	62%	
S7A04AC-VL070-25	60%	
S7A04AC-VL090-50	60%	

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Gearmotor Model Number	Continuous Torque (%)	Comments
S7A08A-VL070-03	54%	
S7A08A-VL070-05	54%	
S7A08A-VL090-10	54%	
S7A08A-VL090-25	52%	
S7A08A-VL120-50	52%	
S7A08AC-VL070-03	54%	
S7A08AC-VL070-05	54%	
S7A08AC-VL090-10	54%	
S7A08AC-VL090-25	52%	
S7A08AC-VL120-50	52%	
S7A10A-VL070-03	24%	
S7A10A-VL070-05	24%	
S7A10A-VL090-10	24%	
S7A10A-VL090-25	22%	
S7A10A-VL120-50	22%	
S7A10AC-VL070-03	24%	
S7A10AC-VL070-05	24%	
S7A10AC-VL090-10	24%	
S7A10AC-VL090-25	22%	
S7A10AC-VL120-50	22%	
S7A15A-VL090-03	55%	
S7A15A-VL090-05	55%	
S7A15A-VL090-10	55%	
S7A15A-VL120-25	55%	
S7A15A-VL120-50	55%	
S7A15AC-VL090-03	55%	
S7A15AC-VL090-05	55%	
S7A15AC-VL090-10	55%	
S7A15AC-VL120-25	55%	
S7A15AC-VL120-50	55%	

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Gearmotor Model Number	Continuous Torque (%)	Comments
S7A20A-VL090-03	Not tested	This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.
S7A20A-VL090-05		
S7A20A-VL120-10		
S7A20A-VL120-25		
S7A20A-VL155-50		
S7A20AC-VL090-03		
S7A20AC-VL090-05		
S7A20AC-VL120-10		
S7A20AC-VL120-25		
S7A20AC-VL155-50		
S7A25A-VL090-03		
S7A25A-VL090-05		
S7A25A-VL120-10		
S7A25A-VL120-25		
S7A25A-VL155-50		
S7A25AC-VL090-03		
S7A25AC-VL090-05		
S7A25AC-VL120-10		
S7A25AC-VL120-25		
S7A25AC-VL155-50		
S7A30A-VL090-03	Not tested	This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.
S7A30A-VL090-05		
S7A30A-VL120-10		
S7A30A-VL120-25		
S7A30A-VL155-50		
S7A30AC-VL090-03		
S7A30AC-VL090-05		
S7A30AC-VL120-10		
S7A30AC-VL120-25		
S7A30AC-VL155-50		

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Gearmotor Model Number	Continuous Torque (%)	Comments
S7A40A-VL090-03	Not tested	This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.
S7A40A-VL090-05		
S7A40A-VL120-10		
S7A40A-VL155-25		
S7A40A-VL205-50		
S7A40AC-VL090-03		
S7A40AC-VL090-05		
S7A40AC-VL120-10		
S7A40AC-VL155-25		
S7A40AC-VL205-50		
S7A50A-VL090-03	Not tested	This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.
S7A50A-VL090-05		
S7A50A-VL155-10		
S7A50A-VL155-25		
S7A50A-VL205-50		
S7A50AC-VL090-03		
S7A50AC-VL090-05		
S7A50AC-VL155-10		
S7A50AC-VL155-25		
S7A50AC-VL205-50		
S7A70A-VL120-03	Not tested	This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.
S7A70A-VL120-05		
S7A70A-VL155-10		
S7A70A-VL205-25		
S7A70A-VL235-50		

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Gearmotor Model Number	Continuous Torque (%)	Comments
S7A02D-VL050-03	75%	
S7A02D-VL050-05	75%	
S7A02D-VL070-10	75%	
S7A02D-VL070-25	70%	
S7A02D-VL070-50	70%	
S7A02DC-VL050-03	75%	
S7A02DC-VL050-05	75%	
S7A02DC-VL070-10	75%	
S7A02DC-VL070-25	70%	
S7A02DC-VL070-50	70%	
S7A04D-VL050-03	62%	
S7A04D-VL050-05	62%	
S7A04D-VL070-10	62%	
S7A04D-VL070-25	60%	
S7A04D-VL090-50	60%	
S7A04DC-VL050-03	62%	
S7A04DC-VL050-05	62%	
S7A04DC-VL070-10	62%	
S7A04DC-VL070-25	60%	
S7A04DC-VL090-50	60%	
S7A08D-VL070-03	54%	
S7A08D-VL070-05	54%	
S7A08D-VL090-10	54%	
S7A08D-VL090-25	52%	
S7A08D-VL120-50	52%	
S7A08DC-VL070-03	54%	
S7A08DC-VL070-05	54%	
S7A08DC-VL090-10	54%	
S7A08DC-VL090-25	52%	
S7A08DC-VL120-50	52%	

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Gearmotor Model Number	Continuous Torque (%)	Comments
S7A10D-VL070-03	24%	This motor combination is not recommended for most applications due to the low continuous torque output.
S7A10D-VL070-05	24%	
S7A10D-VL090-10	24%	
S7A10D-VL090-25	22%	
S7A10D-VL120-50	22%	
S7A10DC-VL070-03	24%	
S7A10DC-VL070-05	24%	
S7A10DC-VL090-10	24%	
S7A10DC-VL090-25	22%	
S7A10DC-VL120-50	22%	

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**S7J Gearmotors**

Gearmotor Model Number	Continuous Torque (%)	Comments
S7J01A-VL050-03	75%	
S7J01A-VL050-05	75%	
S7J01A-VL050-10	75%	
S7J01A-VL050-25	70%	
S7J01A-VL070-50	70%	
S7J01AC-VL050-03	75%	
S7J01AC-VL050-05	75%	
S7J01AC-VL050-10	75%	
S7J01AC-VL050-25	70%	
S7J01AC-VL070-50	70%	
S7J02A-VL050-03	75%	
S7J02A-VL050-05	75%	
S7J02A-VL050-10	75%	
S7J02A-VL070-25	70%	
S7J02A-VL070-50	70%	
S7J02AC-VL050-03	75%	
S7J02AC-VL050-05	75%	
S7J02AC-VL050-10	75%	
S7J02AC-VL070-25	70%	
S7J02AC-VL070-50	70%	
S7J04A-VL050-03	62%	
S7J04A-VL050-05	62%	
S7J04A-VL070-10	62%	
S7J04A-VL070-25	60%	
S7J04A-VL090-50	60%	
S7J04AC-VL050-03	62%	
S7J04AC-VL050-05	62%	
S7J04AC-VL070-10	62%	
S7J04AC-VL070-25	60%	
S7J04AC-VL090-50	60%	



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Gearmotor Model Number	Continuous Torque (%)	Comments	
S7J08A-VL070-03	54%		
S7J08A-VL070-05	54%		
S7J08A-VL090-10	54%		
S7J08A-VL090-25	52%		
S7J08A-VL120-50	52%		
S7J08AC-VL070-03	54%		
S7J08AC-VL070-05	54%		
S7J08AC-VL090-10	54%		
S7J08AC-VL090-25	52%		
S7J08AC-VL120-50	52%		
S7J02D-VL050-03	75%		
S7J02D-VL050-05	75%		
S7J02D-VL050-10	75%		
S7J02D-VL070-25	70%		
S7J02D-VL070-50	70%		
S7J02DC-VL050-03	75%		
S7J02DC-VL050-05	75%		
S7J02DC-VL050-10	75%		
S7J02DC-VL070-25	70%		
S7J02DC-VL070-50	70%		
S7J04D-VL050-03	62%		
S7J04D-VL050-05	62%		
S7J04D-VL070-10	62%		
S7J04D-VL070-25	60%		
S7J04D-VL090-50	60%		
S7J04DC-VL050-03	62%		
S7J04DC-VL050-05	62%		
S7J04DC-VL070-10	62%		
S7J04DC-VL070-25	60%		
S7J04DC-VL090-50	60%		

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S7J08D-VL070-03	54%		
S7J08D-VL070-05	54%		
S7J08D-VL090-10	54%		
S7J08D-VL090-25	52%		
S7J08D-VL120-50	52%		
S7J08DC-VL070-03	54%		
S7J08DC-VL070-05	54%		
S7J08DC-VL090-10	54%		
S7J08DC-VL090-25	52%		
S7J08DC-VL120-50	52%		
S7J15D-VL090-03	25%		This motor combination is not recommended for most applications due to the low continuous torque output.
S7J15D-VL090-05	25%		
S7J15D-VL090-10	25%		
S7J15D-VL120-25	27%		
S7J15D-VL155-50	27%		
S7J15DC-VL090-03	25%		
S7J15DC-VL090-05	25%		
S7J15DC-VL090-10	25%		
S7J15DC-VL120-25	27%		
S7J15DC-VL155-50	27%		

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**S7G Gearmotors**

Gearmotor Model Number	Continuous Torque (%)	Comments
S7G05A-VL070-03	90%	
S7G05A-VL070-05	90%	
S7G05A-VL090-10	90%	
S7G05A-VL090-25	94%	
S7G05A-VL120-50	94%	
S7G05AC-VL070-03	90%	
S7G05AC-VL070-05	90%	
S7G05AC-VL090-10	90%	
S7G05AC-VL090-25	94%	
S7G05AC-VL120-50	94%	
S7G09A-VL090-03	55%	
S7G09A-VL090-05	55%	
S7G09A-VL090-10	60%	
S7G09A-VL120-25	60%	
S7G09A-VL155-50	60%	
S7G09AC-VL090-03	55%	
S7G09AC-VL090-05	55%	
S7G09AC-VL090-10	60%	
S7G09AC-VL120-25	60%	
S7G09AC-VL155-50	60%	
S7G13A-VL090-03	55%	
S7G13A-VL090-05	55%	
S7G13A-VL120-10	60%	
S7G13A-VL120-25	60%	
S7G13A-VL155-50	60%	
S7G13AC-VL090-03	55%	
S7G13AC-VL090-05	55%	
S7G13AC-VL120-10	60%	
S7G13AC-VL120-25	60%	
S7G13AC-VL155-50	60%	

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Gearmotor Model Number	Continuous Torque (%)	Comments		
S7G20A-VL090-03	55%			
S7G20A-VL090-05	55%			
S7G20A-VL120-10	60%			
S7G20A-VL155-25	60%			
S7G20A-VL205-50	60%			
S7G20AC-VL090-03	55%			
S7G20AC-VL090-05	55%			
S7G20AC-VL120-10	60%			
S7G20AC-VL155-25	60%			
S7G20AC-VL205-50	60%			
S7G30A-VL120-03	Not tested		This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.	
S7G30A-VL120-05				
S7G30A-VL155-10				
S7G30A-VL155-25				
S7G30A-VL205-50				
S7G30AC-VL120-03				
S7G30AC-VL120-05				
S7G30AC-VL155-10				
S7G30AC-VL155-25				
S7G30AC-VL205-50				
S7G44A-VL120-03		Not tested		This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.
S7G44A-VL120-05				
S7G44A-VL205-10				
S7G44A-VL205-25				
S7G44A-VL235-50				
S7G44AC-VL120-03				
S7G44AC-VL120-05				
S7G44AC-VL205-10				
S7G44AC-VL205-25				
S7G44AC-VL235-50				

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Gearmotor Model Number	Continuous Torque (%)	Comments
S7G55A-VL155-03	Not tested	This combination has not yet been tested. The continuous output torque is currently unknown, and performance is not guaranteed.
S7G55A-VL155-05		
S7G55A-VL205-10		
S7G55A-VL205-25		
S7G55A-VL235-50		
S7G55AC-VL155-03		
S7G55AC-VL155-05		
S7G55AC-VL205-10		
S7G55AC-VL205-25		
S7G55AC-VL235-50		
S7G75A-VL155-03		
S7G75A-VL155-05		
S7G75A-VL205-10		
S7G75A-VL235-25		
S7G75A-VL235-50		
S7G75AC-VL155-03		
S7G75AC-VL155-05		
S7G75AC-VL205-10		
S7G75AC-VL235-25		
S7G75AC-VL235-50		

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**S7P Gearmotors**

Gearmotor Model Number	Continuous Torque (%)	Comments
S7P01A-VL050-03	90%	
S7P01A-VL050-05	90%	
S7P01A-VL050-10	90%	
S7P01A-VL050-25	90%	
S7P01A-VL070-50	90%	
S7P01AC-VL050-03	90%	
S7P01AC-VL050-05	90%	
S7P01AC-VL050-10	90%	
S7P01AC-VL050-25	90%	
S7P01AC-VL070-50	90%	
S7P02A-VL070-03	95%	
S7P02A-VL070-05	95%	
S7P02A-VL070-10	95%	
S7P02A-VL070-25	90%	
S7P02A-VL070-50	90%	
S7P02AC-VL070-03	95%	
S7P02AC-VL070-05	95%	
S7P02AC-VL070-10	95%	
S7P02AC-VL070-25	90%	
S7P02AC-VL070-50	90%	
S7P04A-VL070-03	65%	
S7P04A-VL070-05	65%	
S7P04A-VL070-10	65%	
S7P04A-VL070-25	60%	
S7P04A-VL090-50	60%	
S7P04AC-VL070-03	65%	
S7P04AC-VL070-05	65%	
S7P04AC-VL070-10	65%	
S7P04AC-VL070-25	60%	
S7P04AC-VL090-50	60%	

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S7P08A-VL090-03	65%		
S7P08A-VL090-05	65%		
S7P08A-VL090-10	65%		
S7P08A-VL090-25	65%		
S7P08A-VL120-50	65%		
S7P08AC-VL090-03	65%		
S7P08AC-VL090-05	65%		
S7P08AC-VL090-10	65%		
S7P08AC-VL090-25	60%		
S7P08AC-VL120-50	60%		
S7P15A-VL090-03	25%		This motor combination is not recommended for most applications due to the low continuous torque output.
S7P15A-VL090-05	25%		
S7P15A-VL090-10	25%		
S7P15A-VL120-25	27%		
S7P15A-VL120-50	27%		
S7P15AC-VL090-03	25%		
S7P15AC-VL090-05	25%		
S7P15AC-VL090-10	25%		
S7P15AC-VL120-25	27%		
S7P15AC-VL120-50	27%		