

4.1 SERVOPACK Ratings and Specifications

⚠ CAUTION

- Take appropriate measures to ensure that the input power supply is supplied within the specified voltage range.
An incorrect input power supply may result in damage to the SERVOPACK. If the voltage exceeds these values, use a step-down transformer so that the voltage will be within the specified range.

4.1.1 Single-phase 100 V

The value of the input power supply voltage is maximum 127 Vrms.

SERVOPACK Model SGDM-	A3B	A5B	01B	02B
Max. Applicable Servomotor Capacity (kW)	0.03	0.05	0.1	0.2
Continuous Output Current (A_{rms})	0.66	0.95	2.4	3.0
Max. Output Current (A_{rms})	2.0	2.9	7.2	9.0
Input Power Supply	Main Circuit	Single-phase 100 to 115 VAC +10% to -15%, 50/60 Hz		
	Control Circuit	Single-phase 100 to 115 VAC +10% to -15%, 50/60 Hz		
Configuration	Base-mounted (Rack mounting available as an option)			
Regenerative Processing	External regenerative resistor			

4.1.2 Single-phase/Three-phase 200 V

The value of the input power supply voltage is maximum 253 Vrms.

SERVOPACK Model SGDM-	A3A	A5A	01A	02A	04A	05A	08A	10A	15A	20A	30A	50A	60A	75A	1AA	1EA
Max. Applicable Servomotor Capacity (kW)	0.03	0.05	0.1	0.2	0.4	0.45	0.75	1.0	1.5	2.0	3.0	5.0	6.0	7.5	11	15
Continuous Output Current (A_{rms})	0.44	0.64	0.91	2.1	2.8	3.8	5.7	7.6	11.6	18.5	24.8	32.9	46.9	54.7	58.6	78.0
Max. Output Current (A_{rms})	1.3	2.0	2.8	6.5	8.5	11.0	13.9	17	28	42	56	84	110	130	140	170
Input Power Supply	Main Circuit	Single-phase/Three-phase 200 to 230 VAC +10% to -15%, 50/60 Hz														
	Control Circuit	Single-phase 200 to 230 VAC +10% to -15%, 50/60 Hz														
Configuration	Base-mounted (Rack mounting available as an option)												Base-mounted (Duct-ventilated available as an option)			
Regenerative Processing	External regenerative resistor						Built-in					External regenerative resistor				

4.1.3 SERVOPACK Ratings and Specifications

Basic Specifications	Control Method		Single or three-phase full-wave rectification IGBT-PWM (sine-wave driven)	
	Feedback		Serial encoder: 13, 16 or 17-bit (incremental/absolute) * The 13-bit encoder is incremental only.	
	Conditions	Ambient/Storage Temperature *1	0 to +55 °C/-20 to +85 °C	
		Ambient/Storage Humidity	90% RH or less (with no condensation)	
Vibration/Shock Resistance		4.9 m/s ² /19.6 m/s ²		
Speed and Torque Control Modes	Performance	Speed Control Range		1:5000 (The lowest speed of the speed control range is the speed at which the servomotor will not stop with a rated torque load.)
		Speed Regulation *2	Load Regulation	0 to 100% load: ±0.01% or less (at rated speed)
			Voltage Regulation	Rated voltage ±10%: 0% (at rated speed)
			Temperature Regulation	25 ± 25 °C: ±0.1% or less (at rated speed)
		Frequency Characteristics		400 Hz (at J _L = J _M)
		Torque Control Tolerance (Repeatability)		±2%
	Soft Start Time Setting		0 to 10 s (Can be set individually for acceleration and deceleration.)	
	Input Signals	Speed Reference Input	Reference Voltage *3	±6 VDC (Variable setting range: ±2 to ±10 VDC) at rated torque (servomotor forward rotation with positive reference), input voltage: maximum ±12 V
			Input Impedance	About 14 k Ω
			Circuit Time Constant	About 47 μ s
		Torque Reference Input	Reference Voltage *3	±3 VDC (Variable setting range: ±1 to ±10 VDC) at rated torque (positive torque reference with positive reference), input voltage: maximum ±12 V
			Input Impedance	About 14 k Ω
			Circuit Time Constant	About 47 μ s
	Contact Speed Reference	Rotation Direction Selection	With P control signal	
Speed Selection		With forward/reverse current limit signal (speed 1 to 3 selection), servomotor stops or another control method is used when both are OFF.		
Position Control Modes	Performance	Bias Setting		0 to 450 min ⁻¹ (setting resolution: 1 min ⁻¹)
		Feed Forward Compensation		0 to 100% (setting resolution: 1%)
		Positioning Completed Width Setting		0 to 250 reference units (setting resolution: 1 reference unit)
	Input Signals	Reference Pulse	Type	Sign + pulse train, 90° phase difference 2-phase pulse (phase A + phase B), or CCW + CW pulse train
			Form	Line driver (+5 V level), open collector (+5 V or +12 V level)
			Frequency	Maximum 500/200 kpps (line driver/open collector)
		Control Signal		Clear signal (input pulse form identical to reference pulse)
		Built-in Open Collector Power Supply *4		+12 V (1k Ω resistor built in)
I/O Signals	Position Output	Form	Phase-A, -B, -C line driver Phase-S line driver (only with an absolute encoder)	
		Frequency Dividing Ratio	Any	
	Sequence Input	Signal allocation can be modified.	Servo ON, P control (or Control mode switching, forward/reverse motor rotation by internal speed setting, zero clamping, reference pulse prohibited), forward run prohibited (P-OT), reverse run prohibited (N-OT), alarm reset, forward current limit, and reverse current limit (or internal speed selection)	
	Sequence Output	Fixed Output	Servo alarm, 3-bit alarm codes	
		Signal allocation can be modified.	Positioning completed (speed coincidence), during servomotor rotation, servo ready, during current limiting, during speed limiting, brake released, warning, selecting three of the NEAR signals.	

Internal Functions	Dynamic Brake		Operated at main power OFF, servo alarm, servo OFF or overtravel.
	Overtravel Stop		Dynamic brake stop at P-OT or N-OT, deceleration to a stop, or coast to a stop
	Electronic Gear		$0.01 \leq B/A \leq 100$
	Protection		Overcurrent, overvoltage, low voltage, overload, regeneration error, main circuit detection section error, heat sink overheated, no power supply, overflow, overspeed, encoder error, overrun, CPU error, parameter error.
	LED Display		Charge, Power, five 7-segment LEDs (built-in Digital Operator functions)
	CN5 Analog Monitoring		Analog monitor connector built in for monitoring speed, torque and other reference signals. Speed: $1 \text{ V}/1000 \text{ min}^{-1}$ Torque: $1 \text{ V}/100\%$ of rated torque Position error pulses: $0.05 \text{ V}/1$ reference units or $0.05 \text{ V}/100$ reference units
	Communications	Connected Devices	Digital Operator (hand-held model), RS-422A port such as for a personal computer (RS-232C ports under certain conditions)
		1:N Communications	Up to $N = 14$ for RS-422A ports
		Axis Address Setting	Set with parameters.
		Functions	Status display, parameter setting, monitor display, alarm trace-back display, JOG and autotuning operations, speed, torque reference signal and other drawing functions.
Others		Reverse rotation connection, zero-point search, automatic servomotor ID, DC reactor connection terminal for harmonic suppressions. *5	

* 1. Use the SERVOPACK within the surrounding air temperature range. When enclosed in a control panel, internal temperatures must not exceed the surrounding air temperature range.

* 2. Speed regulation is defined as follows:

$$\text{Speed regulation} = \frac{\text{No-load motor speed} - \text{Total load motor speed}}{\text{Rated motor speed}} \times 100\%$$

The motor speed may change due to voltage variations or amplifier drift and changes in processing resistance due to temperature variation. The ratio of speed changes to the rated speed represent speed regulation due to voltage and temperature variations.

- * 3. Forward is clockwise viewed from the non-load side of the servomotor. (Counterclockwise viewed from the load and shaft end)
- * 4. The built-in open collector power supply is not electrically insulated from the control circuit in the SERVOPACK.
- * 5. The DC reactor connection terminals for power supplies designed for minimum harmonics are not included in SERVOPACKs with capacities of 6 kW or more.