

# HarmonicDrive® Flattened-Shape Hollow-Structured AC Servo Actuator **SHA SERIES, SG TYPE**



## Size 45 newly added to our line-up of the SHA series, SG type

Size 45 has been newly added to the SHA series of type SG, one of the line-ups of the AC servo actuators that feature compact, flattened hollow structure, offering a wider variety of options to a compact.

The model has performance and shape that supplement the gap between the existing Models 40 and 58 to allow selection of a more suitable maximum torque and moment stiffness.

## Ordering Code

SHA 45 A 101 SG - D 16 A 200 - 10 S17b A - C □ - □

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬ ⑭ ⑮

①	Model name	AC servo actuator SHA series
②	Size	45
③	Version symbol	A
④	Reduction ratio	51 : 1/51 81 : 1/81 101 : 1/101 121 : 1/121 161 : 1/161
⑤	Reduction ratio type	HarmonicDrive® SHG series
⑥	Motor version symbol	D: Size 45
⑦	Motor size	16: Size 45
⑧	Brake	A: Without brake B: With brake

⑨	Applied servo driver input voltage	200: 200V
⑩	Encoder format	10: Compatible with A format Transmission rate: 2.5 Mbps, one-to-one connection
⑪	Encoder type and resolution	17-bit absolute encoder 131072 pulse/revolution
⑫	Encoder phase angle	A: 0 degrees
⑬	Connector specifications	C: Standard connectors included N: No connectors included
⑭	Options	L: Near origin & end limit sensors attached Y: Cables can be escaped from the side
⑮	Special specifications	No entry: Standard product SP: Special-specification product

## Actuator Specifications

Item	Type	SHA45A					
		51	81	101	121	161	
Combined driver		HA-800□-24D/E-200					
Limit for peak torque <sup>*1</sup>	N·m	650	918	982	1070	1147	
	kgf·m	66.3	93.6	100	109	117	
Allowable continuous torque <sup>*1,2</sup>	N·m	174	290	363	437	523	
	kgf·m	17.7	29.6	37.0	44.6	53.3	
Max. rotational speed <sup>*1</sup>	r/min	74.5	46.9	37.6	31.4	23.6	
Torque constant <sup>*1</sup>	N·m/A	25	41	51	61	81	
	kgf·m/A	2.6	4.1	5.2	6.2	8.2	
Limit for peak current <sup>*1</sup>	A	36.5	29.9	25.9	24.5	19.3	
Allowable continuous current <sup>*1,2</sup>	A	10	10	10	10	9.2	
Inductive voltage constant <sup>*3</sup>	V/(r/min)	2.9	4.6	5.7	6.8	9.1	
Phase resistance (20°C)	Ω	0.19					
Phase inductance	mH	1.2					
Moment of Inertia (without brake)	GD <sup>2</sup> /4	kg·m <sup>2</sup>	6.8	17	27	38	68
	J	kgf·cm·s <sup>2</sup>	69	175	272	390	690
Moment of Inertia (with brake)	GD <sup>2</sup> /4	kg·m <sup>2</sup>	7.9	20	31	45	79
	J	kgf·cm·s <sup>2</sup>	81	204	316	454	804
Reduction ratio		1:51	1:81	1:101	1:121	1:161	
Allowable moment load	N·m	1127					
	kgf·m	115					
Moment stiffness	N·m/rad	257×10 <sup>4</sup>					
	kgf·m/arc-min	76.3					
One-way positioning accuracy	arc-sec	50	40	40	40	40	
Encoder type		Absolute encoder					
Encoder resolution	Single revolution detector	2 <sup>17</sup> (131072)					
	Multi revolution detector	2 <sup>16</sup> (65536)					
Output shaft resolution	Pulses per revolution	6684672	10616832	13238272	15859712	21102592	
Mass (without brake)	kg	12.4					
Mass (with brake)	kg	13.2					
Ambient environment specification		Operating temperature: 0 to 40°C, storage temperature: -20 to 60°C Operating/storage humidity: 20 to 80% RH (non-condensing) Vibration resistance: 25 m/s <sup>2</sup> (frequency: 10 to 400 Hz), impact resistance: 300 m/s <sup>2-5</sup> No dust, metal powder, corrosive gases, flammable gases, oil mist, or other similar materials. For indoor use. Exposure to direct sunlight must be avoided. Altitude: 1,000 m or less					
Motor insulation		Insulation resistance: 100 MΩ or higher (500 VDC) Dielectric strength voltage: 1500 VAC/min Insulation class: A					
Mounting direction		Can be installed in any direction.					
Protective structure		Totally enclosed self-cooling type (IP54)					

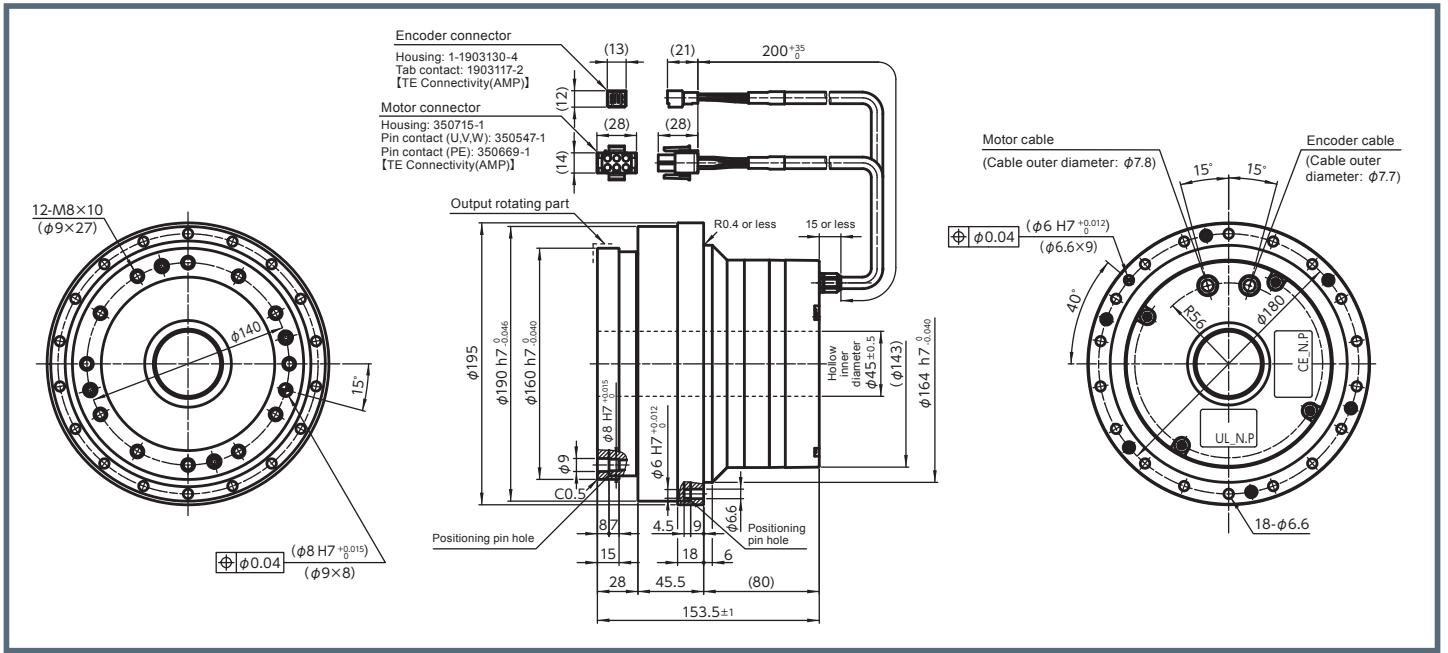
The values in the table above show typical values at the output shaft.

\*1 Typical characteristics when used with our recommended sinusoidal driver. \*2 This is the value at a saturated temperature when installed on the aluminum heatsink of 500x500x25 [mm].

\*3 This is the value of the phase EMF constant multiplied by 3. \*4 The detection range of the multi revolution detector is from -32768 to 32767.

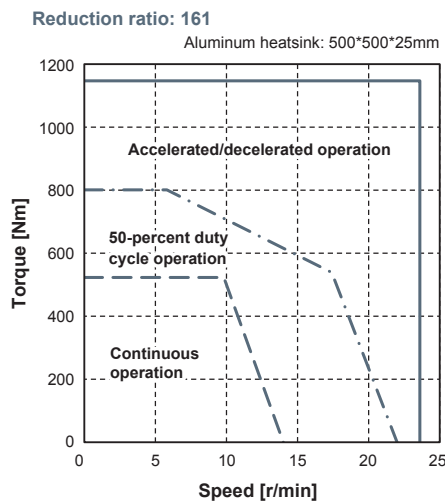
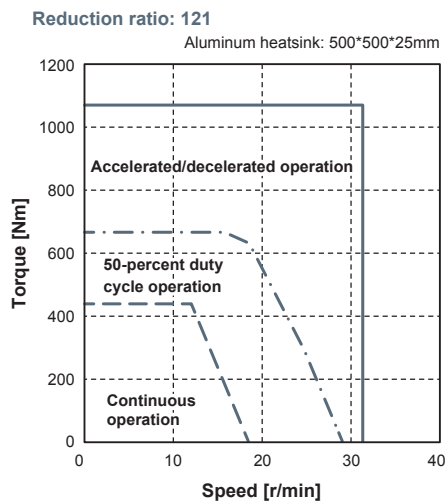
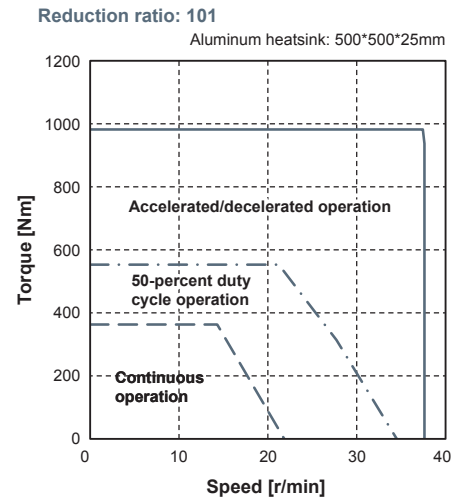
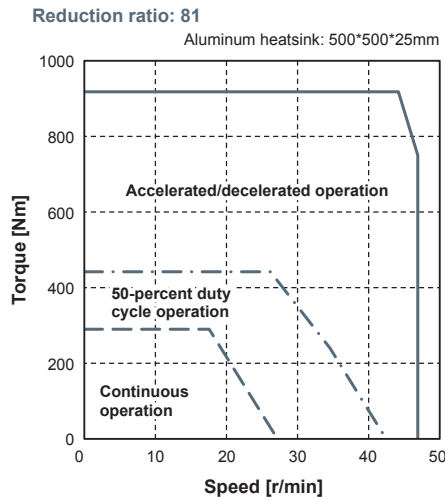
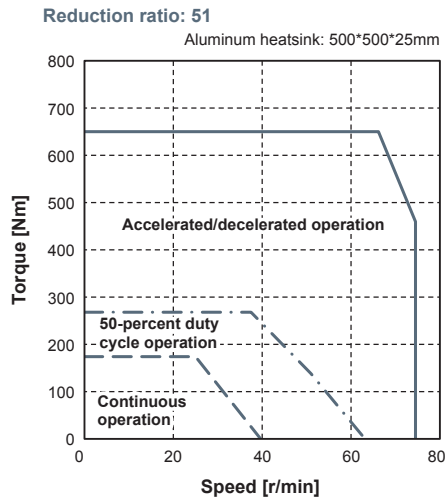
\*5 This value is not ensured if vibrations or shocks are applied continuously for hours.

# External Dimensions





# Operable range

## SHA45A-SG



## Drivers and Intermediate Cables

### Drivers used for SHA45A

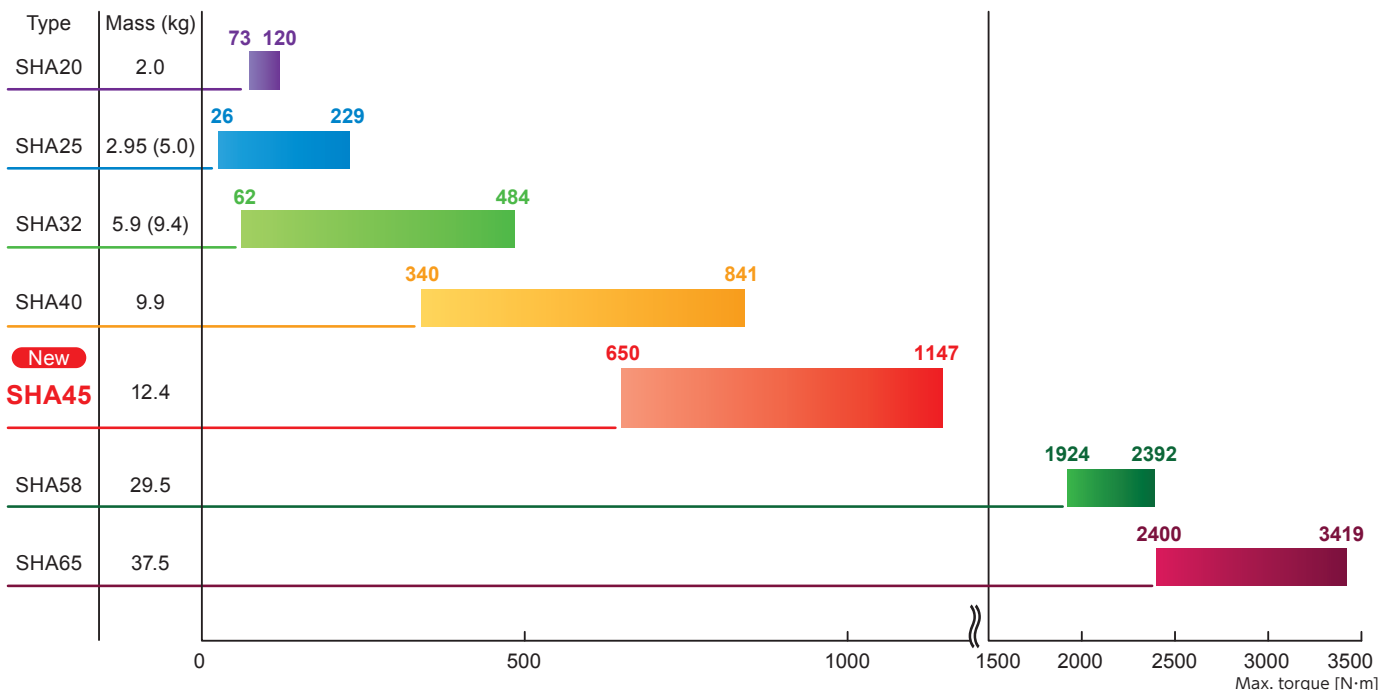
<b>General I/O command type</b> Control modes (for position, speed, and current*) supported *A control mode which controls motor currents	HA - 800A - 24D/E - 200
 <b>MECHATROLINK</b> MECHATROLINK-II supported	HA - 800B - 24D/E - 200
 <b>CC-Link</b> CC-Link supported	HA - 800C - 24D/E - 200

### Intermediate cables used for SHA45A

Motor wire	EWD - MB ** - A06 - TMC
Encoder wire	EWD - S ** - A08 - 3M14

The cable length is indicated by the character "\*" in the intermediate-cable product codes. Three length types are offered: 0.3-, 0.5-, and 10-meter (the codes are "03", "05", "10", respectively).

## Maximum Torque of the SHA Series



\*The figures shown in parentheses indicate the masses when SHAs are combined with the planetary reduction drive HPF series.

■ Please contact our sales department with any questions.

#### Head Office

Ichigo Omori Building 7F, 6-25-3 Minami-Oi,  
Shinagawa-ku, Tokyo 140-0013 JAPAN  
Phone: +81-3-5471-7800 / FAX: +81-3-5471-7811

#### Tokyo Office

Ichigo Omori Building 4F, 6-25-3 Minami-Oi,  
Shinagawa-ku, Tokyo 140-0013 JAPAN  
Phone: +81-3-5471-7830 / FAX: +81-3-5471-7836

#### Tokyo Office, Kitakanto Team

Ichigo Omori Building 4F, 6-25-3 Minami-Oi,  
Shinagawa-ku, Tokyo 140-0013 JAPAN  
Phone: +81-3-6410-8485 / FAX: +81-3-6410-8486

#### Koshin Office

1856-1 Hotakamaki, Azumino-shi, Nagano  
399-8305 JAPAN  
Phone: +81-263-83-6910 / FAX: +81-263-83-6911

#### Chubu Office

TM21-2F, 21 Terugaoka Meito-ku, Nagoya-shi,  
Aichi 465-0042 JAPAN  
Phone: +81-52-773-7451 / FAX: +81-52-773-7462

#### Kansai Office

Shin-Osaka Ueno Toyo Building 3F, 7-4-17 Nishi-nakajima,  
Yodogawa-ku, Osaka-shi, Osaka 532-0011 JAPAN  
Phone: +81-6-6885-5720 / FAX: +81-6-6885-5725

#### Kyushu Office

NMF Hakata-ekimae Building 7F, 1-15-20 Hakata-ekimae,  
Hakata-ku, Fukuoka-shi, Fukuoka 812-0011 JAPAN  
Phone: +81-92-451-7208 / FAX: +81-92-481-2493

#### Head Office

1856-1 Hotakamaki, Azumino-shi, Nagano  
399-8305 JAPAN  
Phone: +81-263-83-6935 / FAX: +81-263-83-6901

#### Hotaka Plant

1856-1 Hotakamaki, Azumino-shi, Nagano  
399-8305 JAPAN  
Phone: +81-263-83-6800 / FAX: +81-263-83-6901



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