

# 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	257×104					
	kgf·m/arc-min	76.3					
One-way positioning accuracy	Sec.	50	40	40	40	40	
Encoder type		Absolute encoder					
Encoder resolution	Single revolution detector	217 (131072)					
	Multi revolution detector	216 (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)					

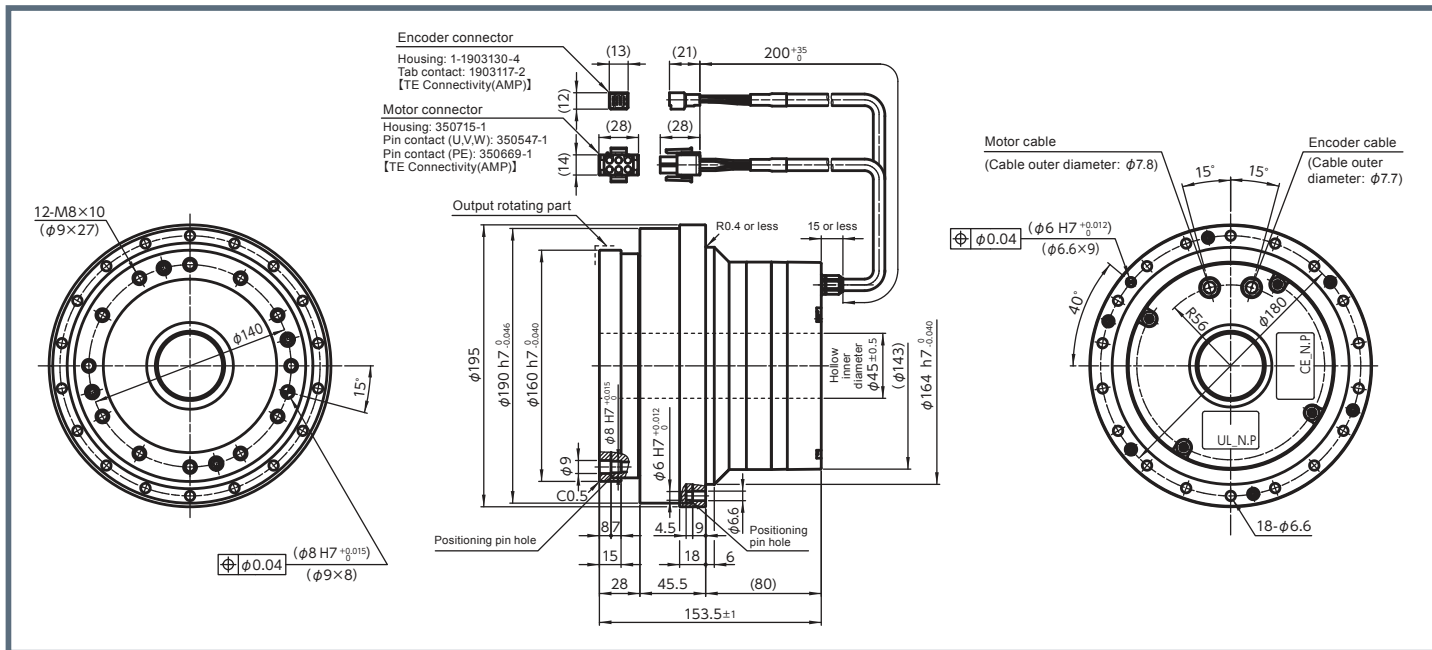
The values in the table above show typical values at the output shaft.

\*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.

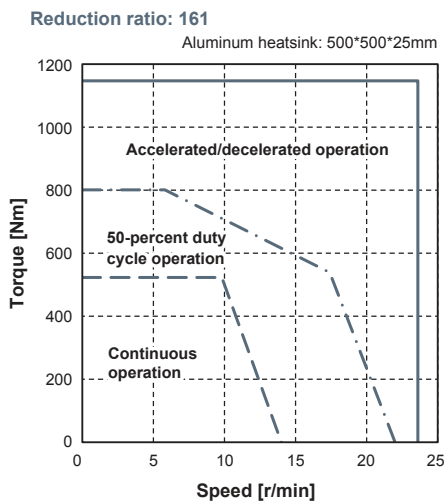
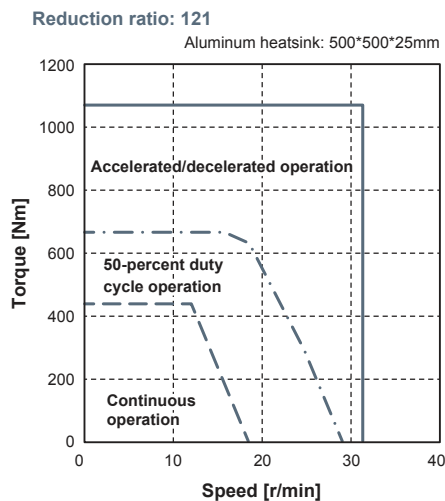
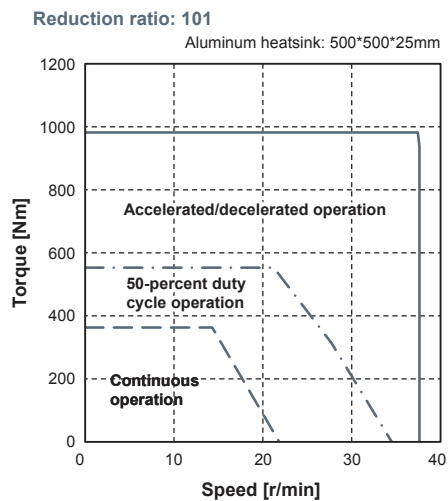
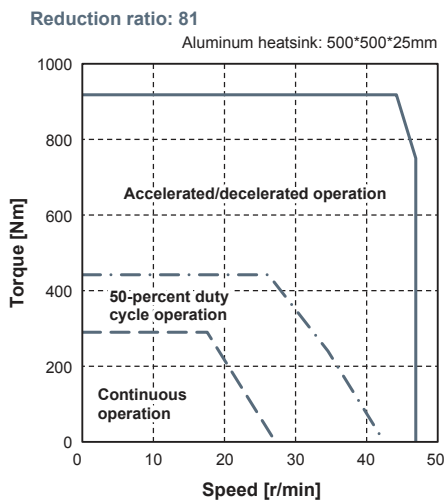
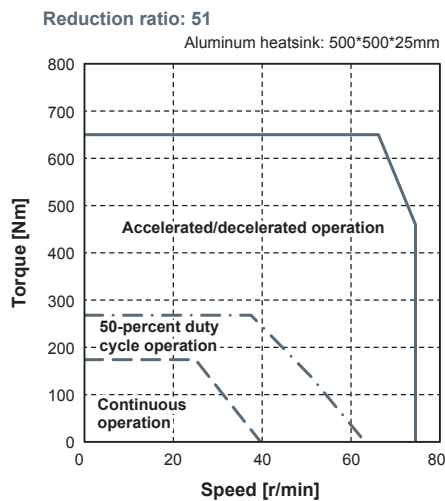
\*5 This value is not ensured if vibrations or shocks are applied continuously for hours.

# External Dimensions





# Operable range

## SHA45A-SG



## Drivers and Intermediate Cables

### Drivers used for SHA45A

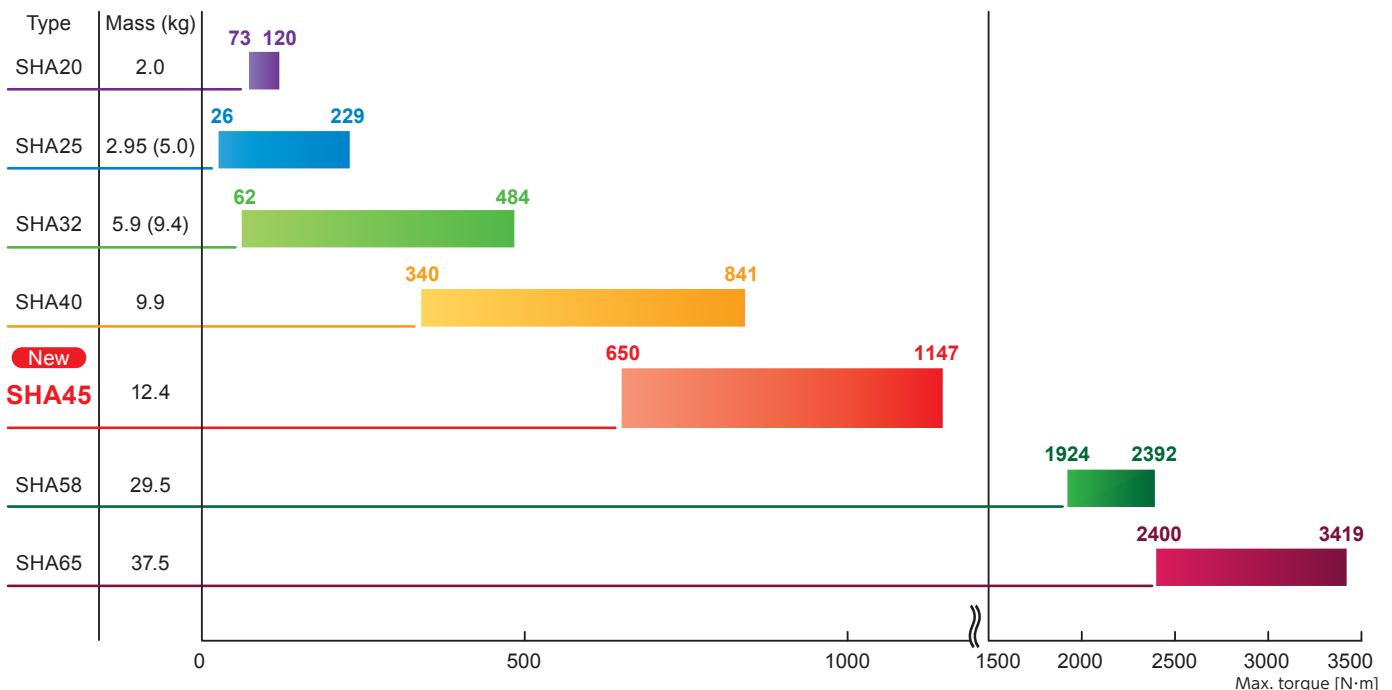
<b>General I/O command type</b> Control modes (for position, speed, and current*) supported *A control mode which controls motor currents	HA - 800A - 24D/E - 200
 <b>MECHATROLINK</b> MECHATROLINK-II supported	HA - 800B - 24D/E - 200
 <b>CC-Link</b> CC-Link supported	HA - 800C - 24D/E - 200

### 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, Fukuokashi, 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



"HarmonicDrive" is a trademark of Harmonic Drive Systems Inc.  
The academic or generic term of our "HarmonicDrive" products is "strain wave gearing."

<http://www.hds.co.jp/>



Registered Trademark in Japan