

HarmonicDrive®

Compact, Hollow Shaft Design

SHA Series of AC Servo Actuators

Harmonic Drive Systems now offers our smallest size of SHA AC Servo Actuators, the SHA20A!

Outside Diameter : $\phi 94$ mm

Length : 108.5 mm

Weight : 2.0 kg (without brake)

Maximum torque:
73 ~ 120Nm

High Accuracy: Zero-backlash Harmonic Drive® gear reducer

High Torque Density: ~ 60 Nm/kg (for 161:1 ratio)

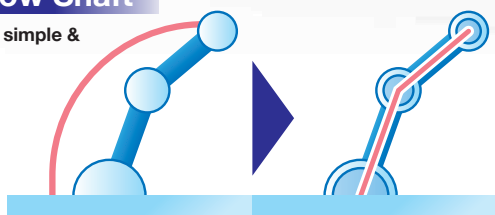
Compact: Flat, Hollow Shaft Design



Ideal for Semiconductor & Flat Panel Display Equipment, Machine Tools and Robot applications!

Large Hollow Shaft

Hollow Shaft enables simple & smart designs.

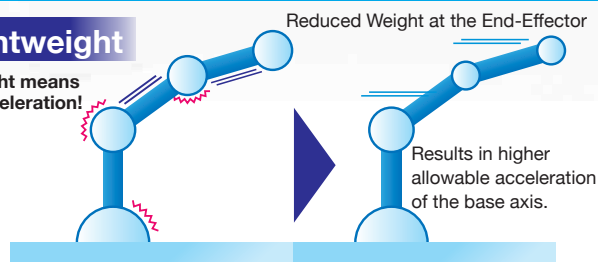


When you use the Hollow Shaft...

Wiring can be kept inside the machine, for a simple and reliable design!

Lightweight

Lightweight means faster acceleration!



When all axis are lightweight...

Smaller actuators may be used, in addition to the benefit of higher acceleration!

Model Code

SHA	20	A	101	SG	-	C	08	A	200	-	10	S17b	A	-	C	-	
①	②	③	④	⑤		⑥	⑦	⑧	⑨		⑩	⑪	⑫		⑬		⑭

① SHA Series AC Servo Actuator

② Size: 20

③ Design Revision: A

④ Reduction Ratio (1/R)

51	1/51
81	1/81
101	1/101
121	1/121
161	1/161

⑤ Gearhead:

SG: Harmonic Drive® SHG Series

⑥ Motor Version C:
Size 20

⑦ Motor Size 08:
Size 20

⑧ Brake
A: Without brake
B: With brake

⑨ Voltage Rating
200: 200V

⑩ Encoder Format
10: A Format, 2.5 Mbps (one to one connection)

⑪ Encoder Resolution
S17b: 17 bit absolute encoder (131,072 counts/revolution)

⑫ Encoder Offset Angle
A: 0 degrees (phase difference between the Motor U phase and the encoder origin)

⑬ Connector Specification
C: With standard connector
N: With pigtails

⑭ Special Options
Blank: Standard Product
SP: Custom Specification

Rating Table / SHA20A

Specification		Size / Ratio	SHA20A				
			51	81	101	121	161
Recommended Driver			HA-800□-3D-200				
Maximum Torque *1	Nm		73	96	107	113	120
	kgf·m		7.4	9.8	10.9	11.5	12.2
Continuous Torque *1*2	Nm		21	35	43	48	48
	kgf·m		2.1	3.6	4.4	4.9	4.9
Maximum Speed *1	r/min		117.6	74.1	59.4	49.6	37.3
Torque Constant *1	Nm/A		16.5	27	33	40	53
	kgf·m/A		1.7	2.7	3.4	4.1	5.4
Maximum Current *1	A		6.0	4.9	4.5	4.0	3.4
Allowable continuous current *1*2	A		2.1	2.0	2.0	1.9	1.6
Voltage Constant *3	V/(r/min)		1.9	3.0	3.7	4.5	5.9
Phase Resistance (20°C)	Ω		1.4				
Phase Inductance	mH		2.5				
Moment of Inertia (without brake)	GD ² /4	kg·m ²	0.23	0.58	0.91	1.3	2.3
	J	kgf·cm·s ²	2.4	6.0	9.3	13	24
Moment of Inertia (with brake)	GD ² /4	kg·m ²	0.26	0.65	1.0	1.4	2.6
	J	kgf·cm·s ²	2.6	6.6	10	15	26
Reduction Ratio			1:51	1:81	1:101	1:121	1:161
Output Moment Load Limit	Nm		187				
	kgf·m		2.0				
Output Moment Stiffness	Nm/rad		25.2×10 ⁴				
	kgf·m/arc min		7.5				
One-way Positioning Accuracy	arc-sec		60	50	50	50	50
Encoder Type			17 bit Absolute Encoder				
Single-turn Encoder Resolution			2 ¹⁷ (131,072)				
Multi-turn Encoder Resolution			2 ¹⁶ (65,536)				
Output Encoder Resolution	Counts / Rev		6,684,672	10,616,832	13,238,272	15,859,712	21,102,592
Mass (without brake)	kg		2.0				
Mass (with brake)	kg		2.1				
Environmental Conditions			Operating temperature: 0 to 40°C / Storage temperature -20°C to 60°C. Operating / Storage humidity: 20 to 80% RH (non-condensing). Vibration resistance: 25 m/s ² (frequency: 10 to 400 Hz) Shock resistance: 300 m/s ² . No dust, No metal powder, No corrosive gas, No flammable gas, No oil mist. To be used indoors, no direct sunlight. Altitude: less than 1000m above sea level				
Motor Insulation			Insulation resistance: 100M or more (DC500V) / Dielectric strength: AC1500V/1min / Insulation Class: E				
Mounting Direction			Can be installed in any direction				
Environmental Protection			Totally enclosed, Self cooling, (equivalent to IP54: Note 4)				

The table shows typical values.

Note 1: When used with the recommended servo drive.

Note 2: Value for saturated temperature when installed on a 320 x 320 x 16 (mm) aluminum heatsink.

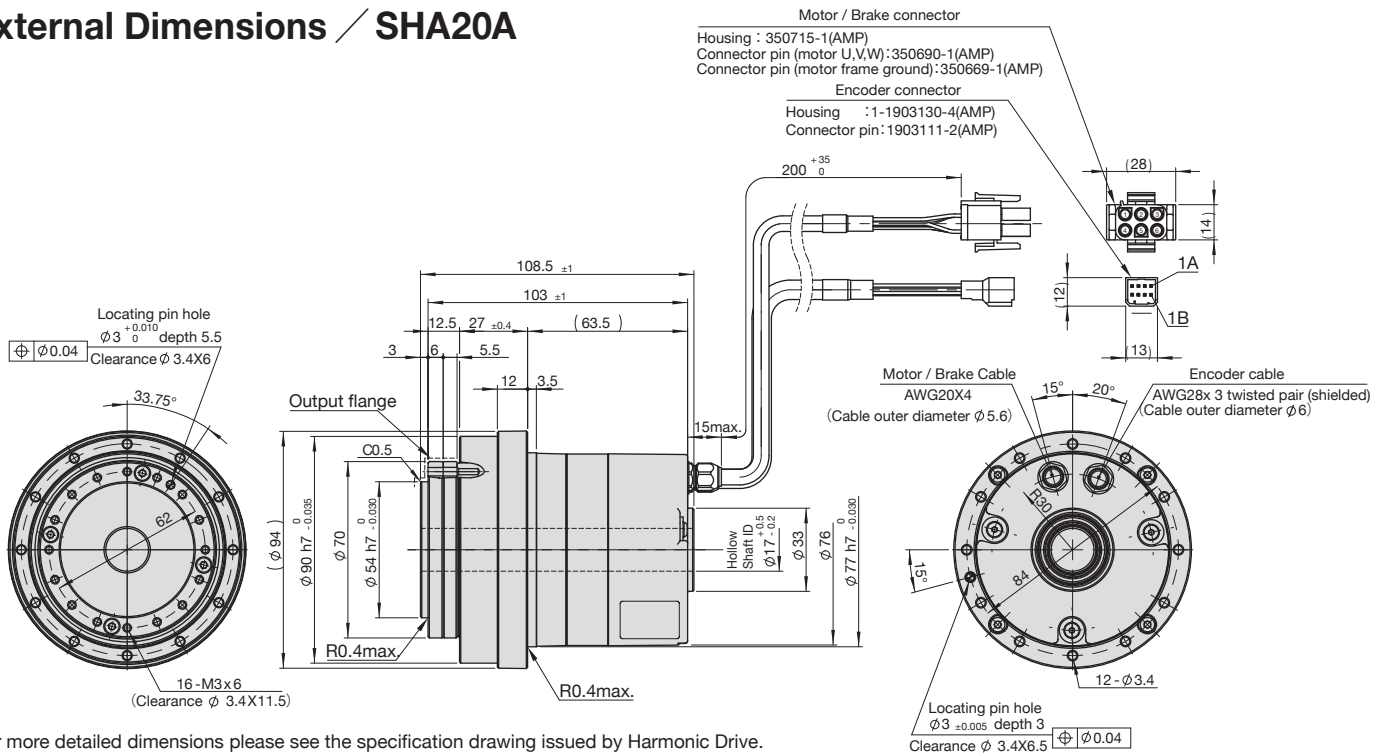
Note3: The value shown is 3 times the phase voltage constant.

Note 4: Housing: The housing design meets IP-54 requirements.

Seals: The lip of the output and encoder seals are not IP-54 compliant neither in static nor dynamic conditions.

Connectors: connectors are not IP-54 compliant.

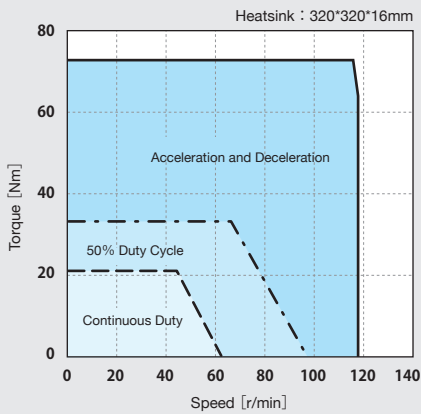
External Dimensions / SHA20A



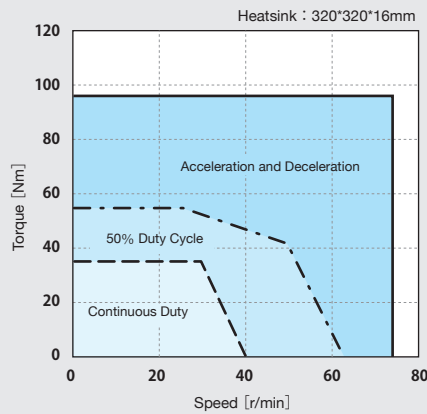
Note: For more detailed dimensions please see the specification drawing issued by Harmonic Drive.

Operating Range / SHA20A

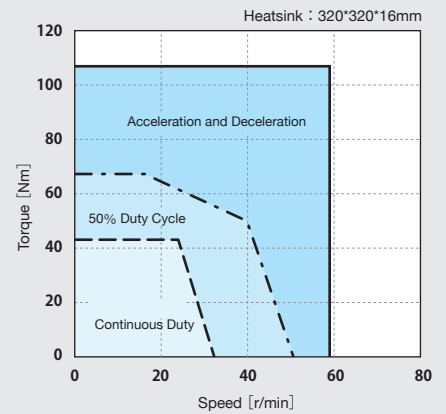
SHA20A51



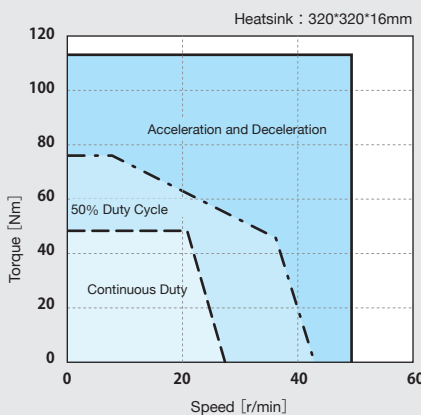
SHA20A81



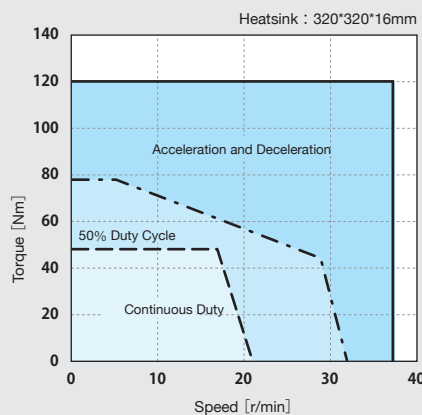
SHA20A101



SHA20A121



SHA20A161

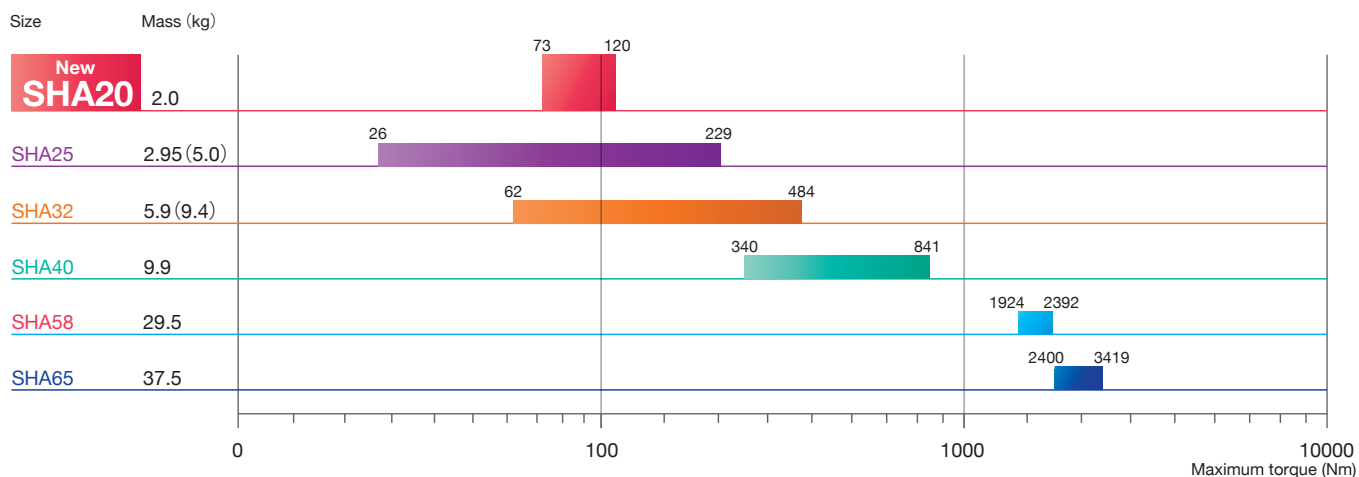


SHA20A Driver and Extension Cables

Recommended driver for SHA20A	
General Purpose I/O Commands Control Modes (Position / Velocity / Current)	HA-800A-3D-200
 MECHATROLINK-IICommands	HA-800B-3D-200
 CC-Link Commands	HA-800C-3D-200
Recommended extension cables for SHA20A	
Motor Cable	EWD-MB**-A06-TN3
Encoder Cable	EWD-S**-A08-3M14

** in the model code indicate the cable length. Please specify: 0 3 = 3 m, 0 5 = 5 m, 1 0 = 10 m

SHA Series Maximum Torque Map



* The value in parentheses is the weight when combined with an HPF Series planetary gear.

Please contact our sales office with any questions.



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"HarmonicDrive" is a trademark of Harmonic Drive Systems Inc.

The academic or general nomenclature of our products "HarmonicDrive" is "strain wave gearing."
The trademark is registered in Japan, Korea and Taiwan

HarmonicDrive®
H-Drive®
HarmonicLinear®
H-Line®

HarmonicPlanetary®
H-Planetary®
BEAM SERVO®
E-Servo®

Harmonicsyn®
H-Syn®

Registered trademark in Japan.

No.1304-OR-SHA20A / news15