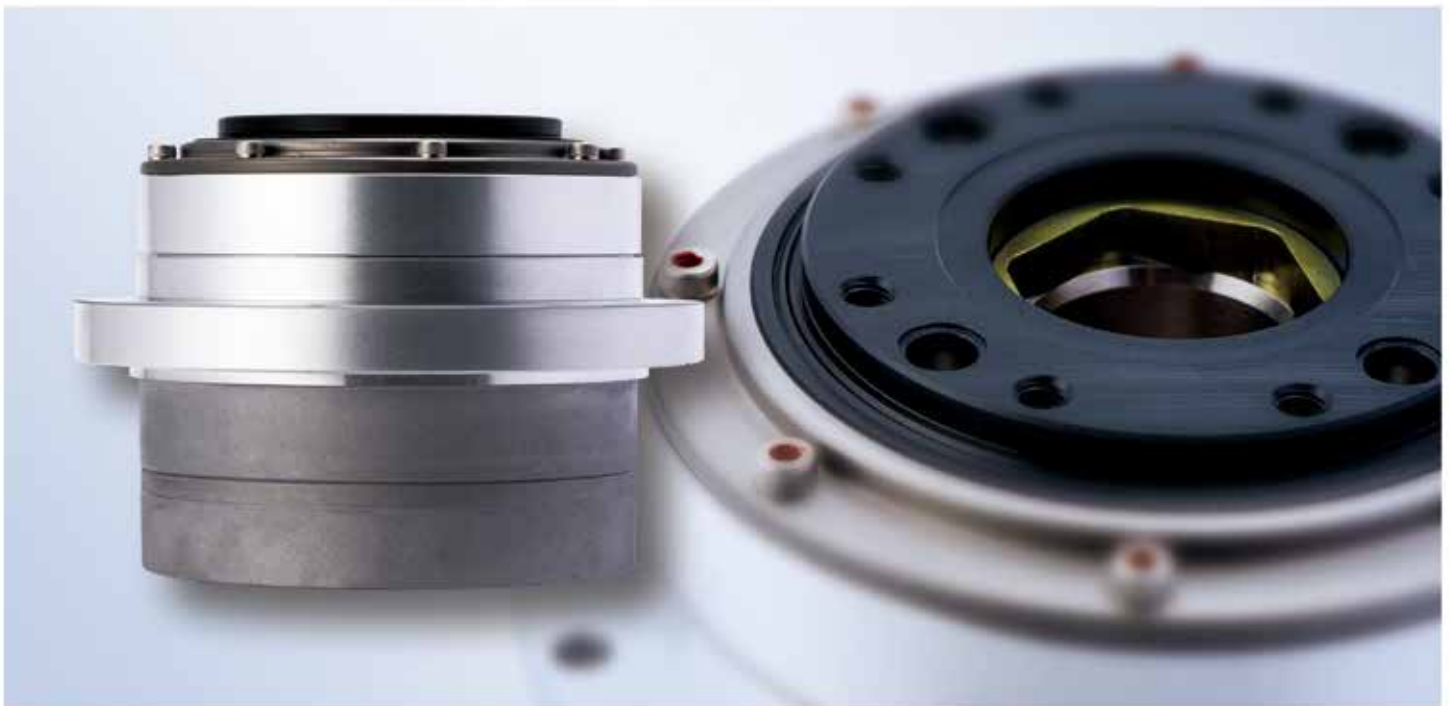


HarmonicDrive®

FHA-C-PR offers High-Precision Rotary Positioning

New! FHA-C Series low-profile, hollow shaft, brushless servo actuators are now available in 4 new models with 3 reduction ratios that achieve high-precision rotary positioning. The new FHA-C-PR models round out the already successful brushless actuator line.

We improved the one way and bi-directional positioning repeatability of the FHA-C series to offer an optimal solution for those applications that require increased accurate positioning.



Improved One-way and Bi-directional Repeatability

■ One-way Repeatability

(Unit: arc-sec)

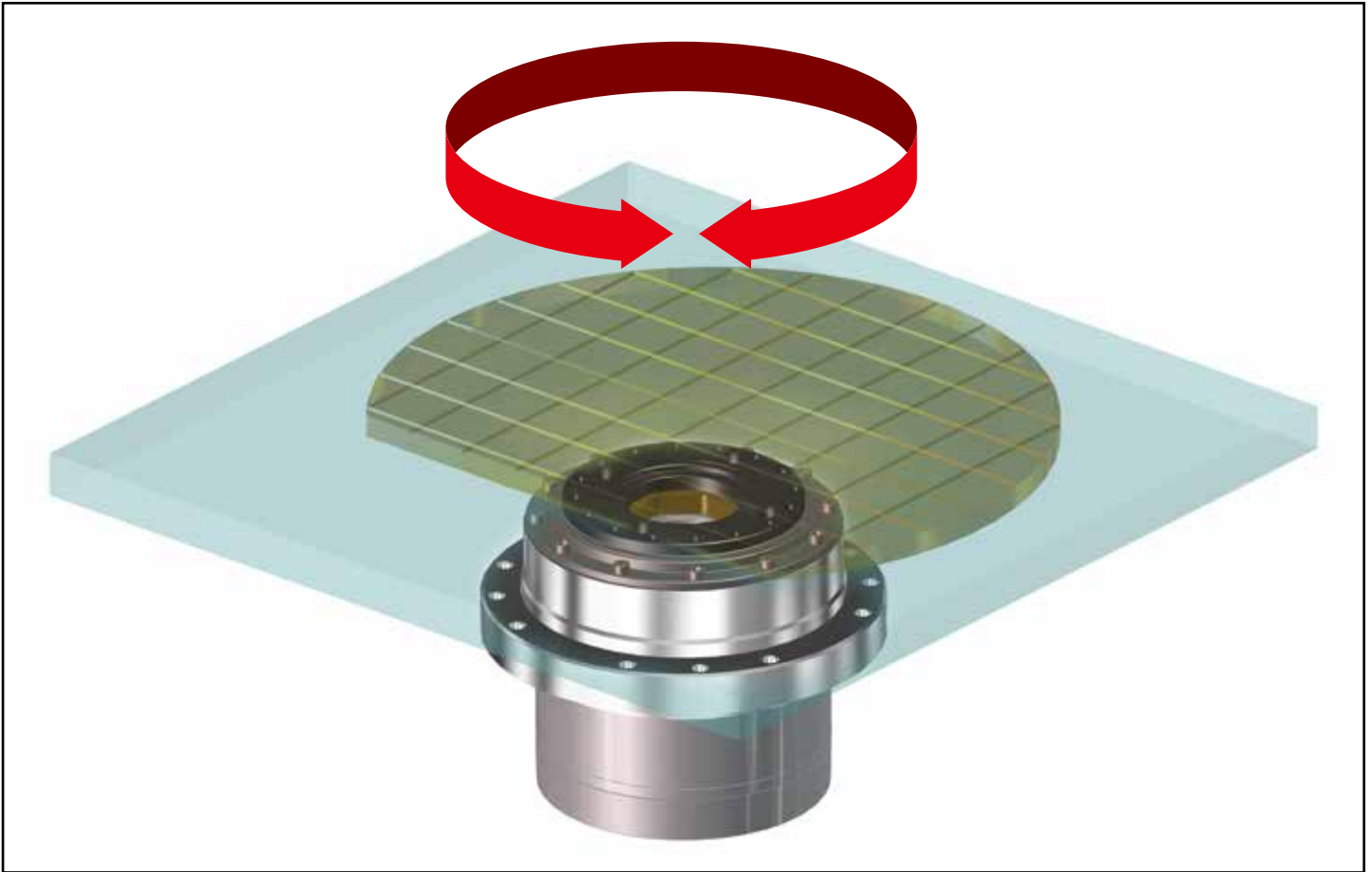
Gear ratio \ Model	FHA-17C-PR	FHA-25C-PR	FHA-32C-PR	FHA-40C-PR
50:1	±5	±5	±4	±4
100:1				
160:1				

■ Bi-directional Repeatability

(Unit: arc-sec)

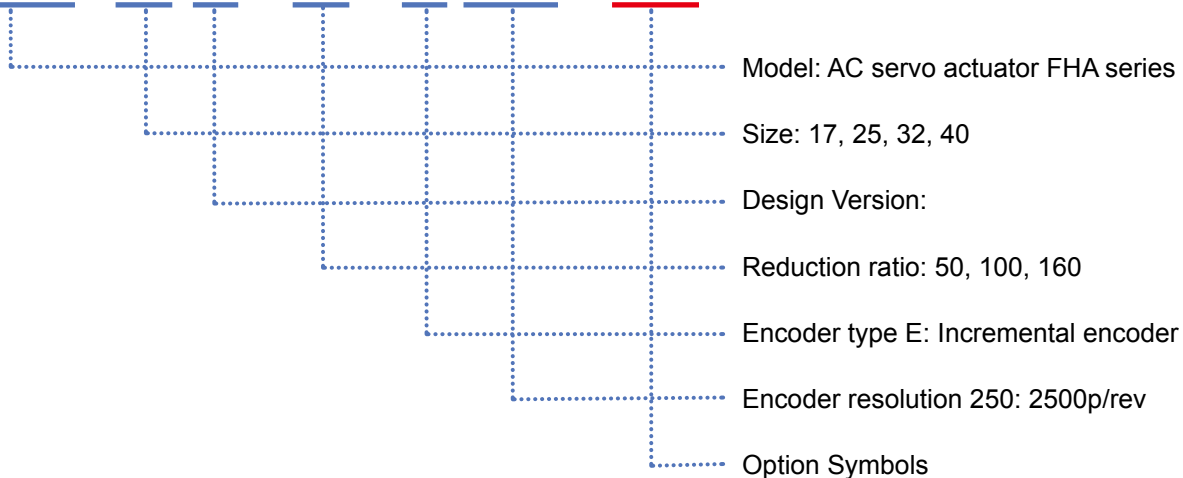
Gear ratio \ Model	FHA-17C-PR	FHA-25C-PR	FHA-32C-PR	FHA-40C-PR
50:1	75	60	50	50
100:1	30	25	20	20
160:1				

The FHA-C-PR is optimal for rotary applications that require high repeatability.



■ Ordering Code

FHA - 17 C - 50 - E 250 - PR



■ Special options

Option specification	Option descriptions	Symbol
Power supply voltage 100V	Available for FHA-17C / 25C / 32C	A
Motor shaft brake	For holding motor shaft	B
With connector	For motor (IP-20), for encoder (IP-40)	C
Cable extension	5m long motor cable and encoder cable	F5

Option specification	Option descriptions	Symbol
Cable exit direction	rear facing	K
Position sensor	Origin and end limits	L
High positioning accuracy	Improved one-way and Bi-directional repeatability	PR

Note: Contact us when using 2 or more options.

FHA-C-PR Specifications

"200V" and "100V" in the table are referred to as the 200V specification (standard) and the 100V specification (option), respectively.

Item	Model Ratio	FHA-17C-xx-E250-PR			FHA-25C-xx-E250-PR			FHA-32C-xx-E250-PR			FHA-40C-xx-E250-PR			
		50	100	160	50	100	160	50	100	160	50	100	160	
Maximum torque	N•m	39	57	64	150	230	260	281	398	453	500	690	820	
	kgf•m	4.0	5.8	6.5	15.3	23.5	26.5	28.7	40.6	46.2	51	70.4	83.7	
Maximum speed	rpm	96	48	30	90	45	28	80	40	25	70	35	22	
Torque constant	200V	N•m/A	21	42	67	22	45	72	27	54	86	31	64	102
		kgf•m/A	2.1	4.3	6.8	2.3	4.6	7.3	2.8	5.5	8.8	3.2	6.5	10.4
	100V	N•m/A	11	21	33	11	22	36	13	27	43	-	-	-
		kgf•m/A	1.1	2.2	3.4	1.2	2.3	3.7	1.4	2.8	4.4	-	-	-
Maximum current ²	200V	A	2.1	1.6	1.1	7.3	5.6	4.0	11.4	8.0	5.9	17.3	11.8	9.0
	100V	A	4.2	3.2	2.2	15	11	8.0	23	16	12	-	-	-
EMF voltage constant	200V	V/(rpm)	2.3	4.7	7.5	2.5	5.1	8.1	3.0	5.9	9.5	3.6	7.2	11.4
	100V	V/(rpm)	1.2	2.4	3.8	1.3	2.6	4.1	1.5	3.0	4.8	-	-	-
Phase resistance	200V	Ω (20°C)	7.9			2.6			1.0			0.73		
	100V	Ω (20°C)	2.0			0.65			0.25			-		
Phase inductance	200V	mH	6.0			2.6			1.3			1.5		
	100V	mH	1.5			0.65			0.33			-		
Moment of inertia	(GD ² /4)	kg•m ²	0.21	0.83	2.1	0.90	3.5	9.2	2.1	8.2	21	5.5	22	56
	(J)	kgf•cm•s ²	2.1	8.5	21	9	37	94	21	84	215	56	223	569
Reduction ratio		50:1	100:1	160:1	50:1	100:1	160:1	50:1	100:1	160:1	50:1	100:1	160:1	
Allowable radial load	kN	2.9			4.9			9.5			14.7			
	kgf	300			500			970			1500			
Allowable axial load	kN	9.8			14.7			24.5			39.2			
	kgf	1000			1500			2500			4000			
Max. moment load	N•m	188			370			530			690			
	kgf•m	19			38			54			70			
Moment stiffness	N•m/rad	220×10 ³			490×10 ³			790×10 ³			1400×10 ³			
	kgf•m/arc-min	6.5			15			23			42			
One-way positioning accuracy	arc-sec	60	40	40	40	30	30	40	30	30	40	30	30	
One-way repeatability	arc-sec	±5			±5			±4			±4			
Bi-directional repeatability	arc-sec	75	30	30	60	25	25	50	20	20	50	20	20	
Motor encoder		2500 counts / revolution												
Quad encoder resolution ³	Pulse/rev	500,000	1,000,000	1,600,000	500,000	1,000,000	1,600,000	500,000	1,000,000	1,600,000	500,000	1,000,000	1,600,000	
Mass	kg	2.8			4.7			7.1			13.6			
Enclosure		Totally enclosed self-cooling (IP44)												
Environmental conditions		Operating temperature: 0 to 40°C/storage temperature: -20 to 60°C Operating humidity / storage humidity: 20 to 80%RH (no condensation) Vibration resistance: 24.5m/s ² (frequency: 10 to 400Hz) / shock resistance: 294 m/s ² Do not expose to dust, metal powder, corrosive gas, flammable gas, or oil mist. Use indoors, and do not expose to direct sunlight. Altitude: 1000 m or lower above sea level												
Motor insulation		Insulation resistance: 100MΩ or higher (500 VDC) Withstanding voltage: AC1500V/1min Insulation class: Type F												
Orientation		All position												
Combination servo driver	200V	HA-800*-3C-200			HA-800*-3C-200			HA-800*-6C-200			HA-800*-6C-200			
	100V	HA-800*-3C-100			HA-800*-6C-100			HA-800*-6C-100			-			

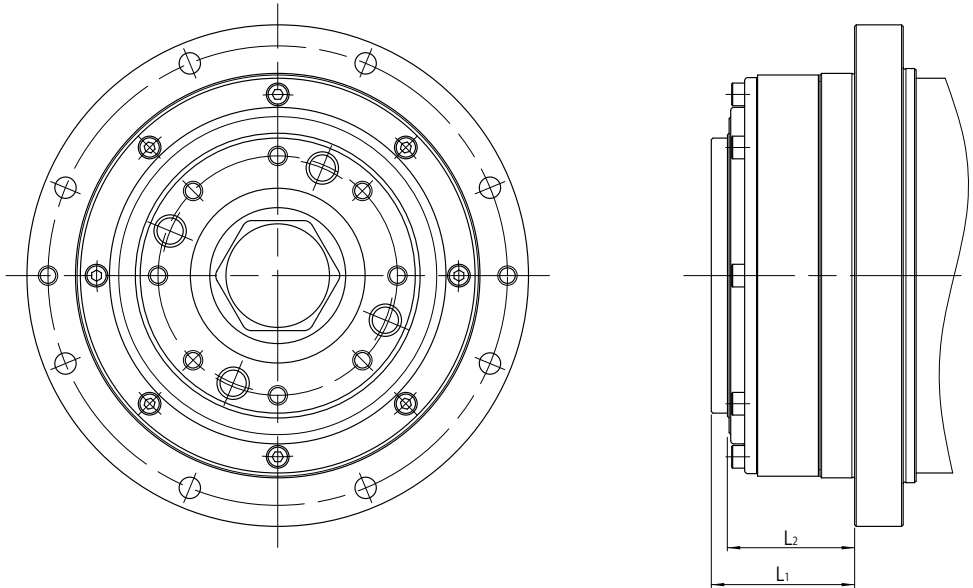
Note 1: The values in the table above are referred to as typical values for the output shaft.

Note 2: The value when used with the HA-800 driver.

Note 3: The output shaft resolutions are obtained by (motor encoder resolution x 4) x (reduction ratio)

External Dimensions

Compared to the standard FHA-C series, only the dimensions of L_1 and L_2 differ for the FHA-C-PR as shown. All other dimensions are the same. Refer to the "General Catalog for Mechatronics Products," "FHA-C Series Technical Manual," and "Confirmation Drawing."



(Unit: mm)

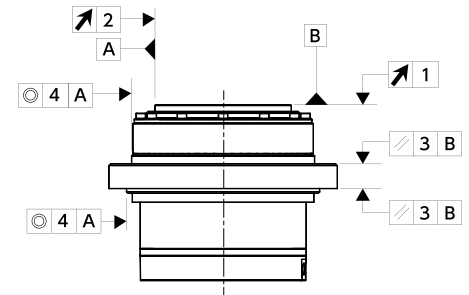
Actuator model	FHA-17C-PR	FHA-25C-PR	FHA-32C-PR	FHA-40C-PR
Dimension L_1	35	44.3	46	58.5
Dimension L_2	29.5	39.3	41	51.5

Mechanical Accuracy

The FHA-C-PR mechanical accuracies of the output shaft and mounting flange are shown below:

(Unit: mm)

Feature	FHA-17C-PR	FHA-25C-PR	FHA-32C-PR	FHA-40C-PR
1. Output shaft surface runout	0.010	0.012	0.012	0.014
2. Output shaft axial runout	0.010	0.012	0.012	0.014
3. Parallelism between output shaft and mounted surface	0.040	0.050	0.050	0.060
4. Concentricity between output shaft and fitting part	0.040	0.050	0.050	0.060



Note: For information on the measurement method, refer to the "FHA-C Series Technical Manual."

Note: Values are based on the Total Indicator Reading (T.I.R.).

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