

ROKAE New-Generation Integrated Force-Controlled Joint

HSA Series



Joint Force Control

"Millisecond-level" Response

Closed-loop refresh
rate stably reaches

1KHz

"Microgram-level" Force Sensing

Resolution

<0.05Nm

Strong Performance

High-performance Frameless Torque Motor

Max speed

6000rpm

High-precision Harmonic Reducer

Max joint torque density

50Nm/kg

Lightweight & Highly Integrated

Single-plane Encoder Layout

Min Joint Weight

413g

Extra-large Hollow Size

10% better than industry avg.

Installation Space

20% saved

Comprehensive Configuration

Safety

Suction Contracting Brake:
Power-off instant locking

Precision

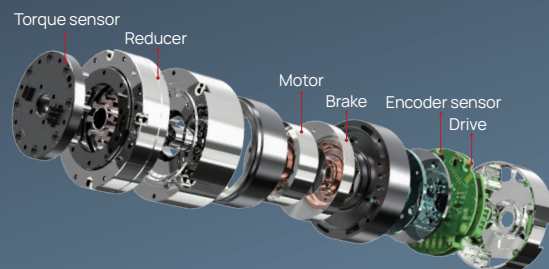
Dual Encoders (double redundancy
verification): Accurate position anchoring
under extreme conditions

Sensing

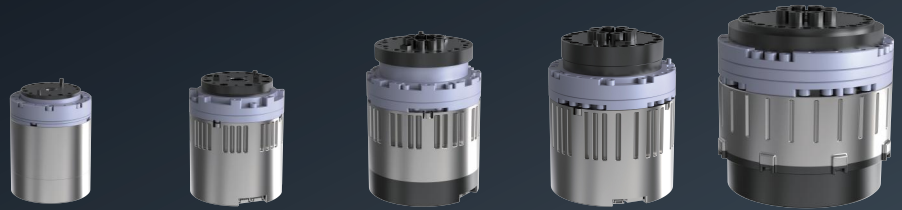
High-precision Force Sensor:
"Microgram-level" force sensing & control
"Millisecond-level" synchronization precision

Integrated Force-Controlled Joint Solution

Equipped with high-performance controller
Provides force control algorithm solutions
Supports teleoperation for remote precise control



Parameter Specifications



Parameter Category	HSA-11	HSA-14	HSA-17	HSA-20	HSA-25
Motor Type	Inner-rotor Frameless Torque Motor				
Dimension (Diameter/Length, mm)	52/62	60/74	72/98	82/107	110/115
Hollow Inner Diameter (mm)	6	9	10	13	15
Weight (With/Without Brake, g)	413 (without)	600(with)	1100 (with)	1700 (with)	2800 (with)
Operating Voltage (V)	48	48	48	48	48
Joint Rated Power (W)	38	120	240	450	750
Gear Ratio	51	100	100	120	100
Rated Speed (rpm)	60	35	45	35	30
Torque Density (Nm/kg)	13.3	12.8	46.4	37.6	50
Max Allowable Avg Load Torque (Nm)	5.5	7.7/13.5*	51	64	140
Peak Torque (Nm)	8.3	19	66	108	194
Torque Sensor Rated Torque (Nm)	/	25	70	110	210
Torque Sensor Resolution(Nm)	/	≤0.05	≤0.05	≤0.05	≤0.05
Torque Sensor Max Range(Nm)	/	50	140	220	420
Max Allowable Overload Torque (Nm)	/	75	210	330	630
Force Control Closed-Loop Bandwidth	100Hz				
Impedance Control Frequency	1kHz				
Force Control Sampling Frequency	32kHz				
Encoder Precision (bit)	19				
Encoder Type	Dual Absolute				
Communication	EtherCAT				

Note: *Supports optional configurations



ROKAE Robotics

400-010-8700
www.rokae.com
sales@rokae.com



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