

ROKAE New-Generation Integrated Force-Controlled Joint

HSA Series



Joint Force Control

High-frequency
force control sampling **32KHz**

Control frequency **> 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 **48Nm/kg**

Lightweight & Highly Integrated

Single-plane Encoder Layout

Min Joint Weight **450g**

Extra-large Hollow Size

10% better than industry avg.

Installation Space

20% saved

Comprehensive Configuration

Safety

Suction Contracting Brake:
Power-off instant locking

Precision

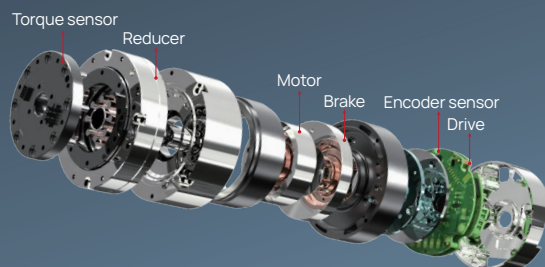
Dual Encoders (double redundancy
verification): Accurate position anchoring
under extreme conditions

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	HSA-32
Motor Type	Inner-rotor Frameless Torque Motor					
Dimension (Diameter/Length, mm)	52/68	60/74	72/98	82/107	110/115	142/135
Hollow Inner Diameter (mm)	6	9	10	13	15	21
Weight (With/Without Brake, g)	450 (without) * ¹	600(with)	1100 (with)	1700 (with)	2950 (with)	6000 (with)
Operating Voltage (V)	48	48	48	48	48	48
Joint Rated Power (W)	40	120	160	250	600	950
Gear Ratio	100	100	100	120	100	120
Rated Speed (rpm)	30	30	30	30	30	20
Torque Density (Nm/kg)	19.8	12.8	46.4	37.6	47.5	46.8
Max Allowable Avg Load Torque (Nm)	8.9	7.7/14* ²	51	64	140	281
Peak Torque (Nm)	11	19	70	113	204	459
Torque Sensor Rated Torque (Nm)	12	25	70	110	210	480
Torque Sensor Resolution(Nm)	≤0.05	≤0.05	≤0.05	≤0.05	≤0.05	≤0.05
Torque Limit (Nm)	36	75	210	330	630	1440
Force Control Closed-Loop Bandwidth	100Hz					
Impedance Control Frequency	1kHz					
Force Control Sampling Frequency	32kHz					
Encoder Precision (bit)	18					
Encoder Type	Dual Absolute					
Communication	EtherCAT					

Note: *1 Supports optional configurations with Brake, *2 Supports optional configurations



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