ENGINEERING DOCUMENTATION

Hybrid Hollow-Shaft Stepper Motor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-ST-23HS2045-4D-200	DRAFT-08 / 28 Aug 2026	Engineering Integration Reference

Integration Overview

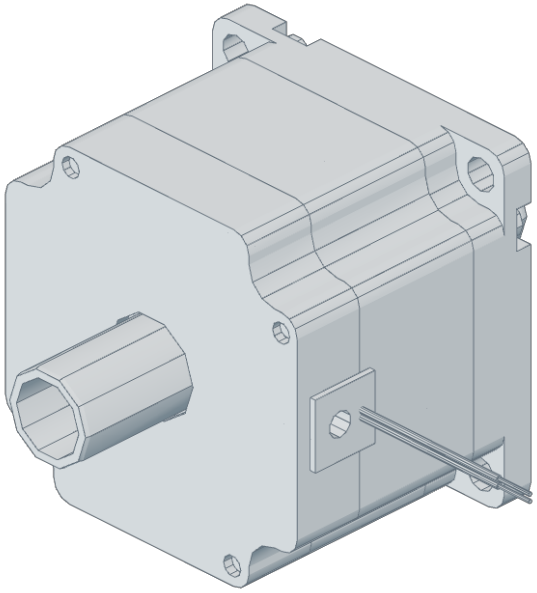
Hybrid stepper motor for indexed positioning and specified rotary motion. This guide supports mounting, shaft, load-path, drive-current, phase, thermal, cable and commissioning planning for ES-ST-23HS2045-4D-200.

Key Integration Facts

INTEGRATION ITEM	VALUE
Detent Torque	0.03 N·m
Holding Torque	0.8 N·m
Phase Resistance	1.75 Ω
Continuous Rated Current	2 A RMS
Phase Inductance	4.1 mH
Step Angle	1.8 °
Rated Voltage	3.5 V
Body Length	45 mm

3D Orientation Reference

This axonometric reference provides a quick orientation check for the motor or actuator body, output interface and mounting relationship of ES-ST-23HS2045-4D-200.



Axonometric Orientation View

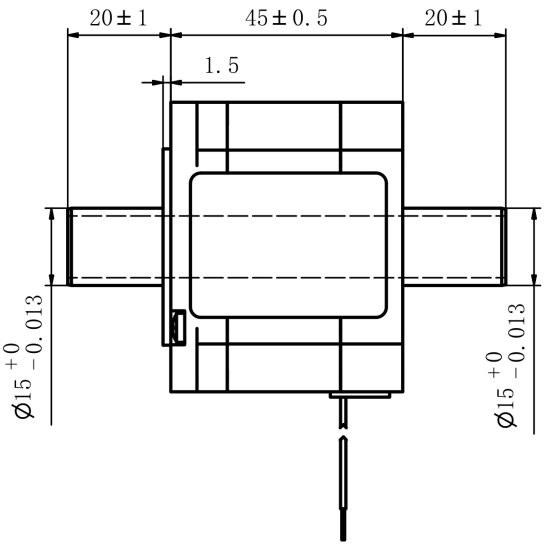
Orientation reference only. Use the exact-SKU parameter table and mechanical drawing for dimensions, hole geometry, fits and machining decisions.

Exact-SKU Interface Cross-Reference

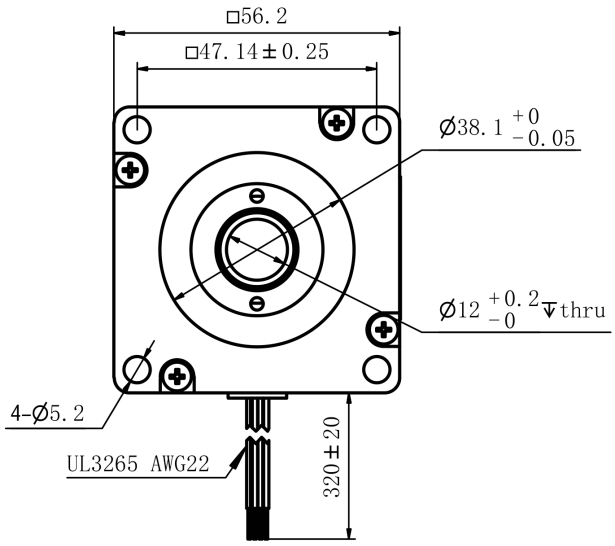
INTEGRATION TOPIC	EXACT-SKU REFERENCE
Motor envelope and output orientation	Frame Size: 57 mm; Body Length: 45 mm. Confirm interface geometry, fits and installation details in the exact-SKU mechanical drawing.
Drive and motion boundaries	Rated Voltage: 3.5 V; Continuous Rated Current: 2 A RMS; Holding Torque: 0.8 Nm; Step Angle: 1.8 °. Confirm interface geometry, fits and installation details in the exact-SKU mechanical drawing.
Installed load and thermal reference	Confirm this interface or boundary from the exact-SKU parameter table and mechanical drawing.

Product Structure & Views

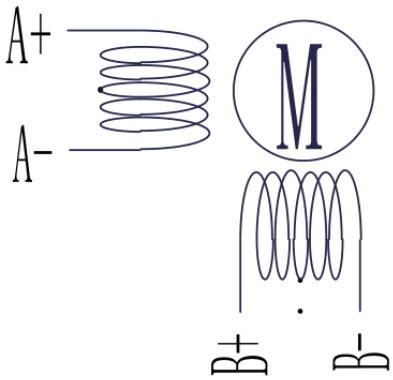
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



Mechanical View 1



Mechanical View 2



Mechanical View 4

VIEW	FIELD	VALUE
Mechanical View 1	Overall length left segment	20±1 mm
	Overall length center segment	45±0.5 mm
	Overall length right segment	20±1 mm
	Boss depth	1.5 mm
	Left shaft diameter	Φ5 +0/-0.013 mm
	Right shaft diameter	Φ5 +0/-0.013 mm

VIEW	FIELD	VALUE
Mechanical View 4	Housing envelope dimension (square)	□56.2 mm
	Mounting face dimension (square, with tolerance)	□47.14±0.25 mm
	Output shaft diameter (unilateral tolerance)	Ø38.1 +0/-0.05 mm
	Center through-hole diameter (with tolerance and surface finish)	Ø12 +0.2/0 mm, surface finish, through hole
	4 mounting holes diameter	4-Ø5.2 mm

Technical Specifications

PARAMETER	VALUE	UNIT
Detent Torque	0.03	N·m
Holding Torque	0.8	
Phase Resistance	1.75	Ω
Continuous Rated Current	2	A RMS
Phase Inductance	4.1	mH
Step Angle	1.8	°
Rated Voltage	3.5	V
Body Length	45	mm
Motor Construction Type	Hollow Shaft Stepper Motor	
Lead Wire Configuration	Bipolar, 4 flying leads	
Frame Size	57	mm
Shaft Configuration	Double shaft	
NEMA Size	23	
Lead Wire Count	4	
Phase Count	2	

Mounting, Shaft and Load Path

- Support the complete mounting face, preserve locating features and verify fastener engagement without distorting the housing.
- Align the shaft and coupling before tightening, and validate radial load, axial load, overhung distance, belt tension, inertia and shock for the installed mechanism.

Drive, Electrical and Motion Integration

- Set phase current, microstep, acceleration and speed for the actual load inertia, resonance behavior and installed thermal condition.
- Use applicable wiring data for conductor identity, polarity, phase pairing, shielding and grounding; do not infer these from the product view.

Thermal, Cable and Commissioning Conditions

- Validate housing and winding temperature over the intended operating cycle, ambient condition, mounting heat path and enclosure airflow.
- Provide strain relief and service clearance, then commission at reduced energy and verify direction, current limits, motion response, temperature and fault behavior.

Integration Checklist

01	Confirm the exact-SKU drawing and parameter set.
02	Verify mounting geometry, locating features, shaft engagement, coupling alignment and service clearance.
03	Validate torque, speed, inertia, radial and axial loads, overhung distance and shock.
04	Set drive, current, motion, wiring, grounding and thermal boundaries from applicable product documentation.
05	Commission at reduced energy and verify direction, motion response, temperature and fault behavior.

View SKU Product Datasheet Request controlled 2D drawing Request controlled STEP review Request a Quote

Engineering Use and Verification Notice

01. This Dimensional & Integration Guide applies only to EmbodyStack SKU ES-ST-23HS2045-4D-200 and is intended for dimensional evaluation and preliminary integration. It is not a applicable manufacturing drawing, motor or actuator application approval, wiring definition, drive-selection approval, machinery risk assessment, safety validation or production authorization. Before design freeze, installation or energization, verify all dimensions, mounting and locating features, moving envelopes, shaft or output geometry, permissible loads, alignment, supply and current limits, wiring, motion profile, duty cycle, thermal condition, cable routing, environmental boundaries, maintenance and fault response against the applicable EmbodyStack engineering data for this exact SKU. Validate the complete installed system under intended operating and fault conditions.