ENGINEERING DOCUMENTATION

Coreless Brushless Motor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-CM-BL02-M001	DRAFT-08 / 28 Aug 2026	Engineering Integration Reference

Integration Overview

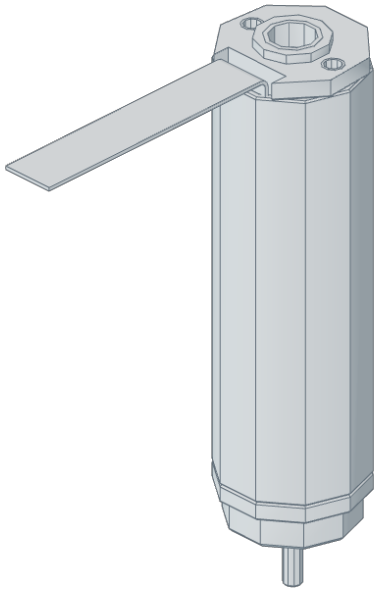
Compact electric motor for specified rotary actuation. This guide supports mounting, shaft, load-path, drive, thermal, cable and commissioning planning for ES-CM-BL02-M001.

Key Integration Facts

INTEGRATION ITEM	VALUE
Rated Torque	0.8 mN·m
Rated Speed	38200 rpm
Continuous Rated Output Power	3.25 W
No-Load Rotational Speed	48000 rpm
Pole Pairs	1
Peak Current	2 A
Torque Constant	1.77 mN·m/A
Continuous Rated Current	0.45 A

3D Orientation Reference

This axonometric reference provides a quick orientation check for the motor or actuator body, output interface and mounting relationship of ES-CM-BL02-M001.



Axonometric Orientation View

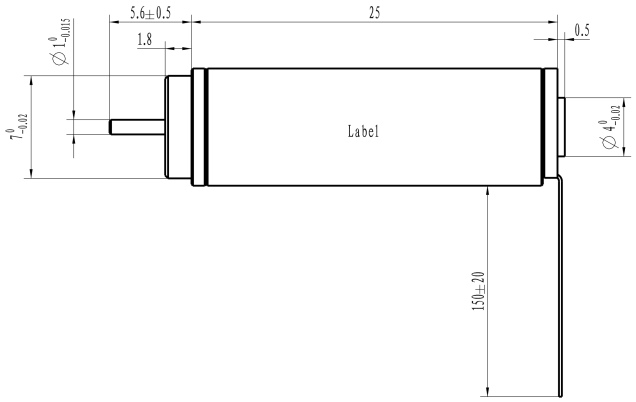
Orientation reference only. Use the exact-SKU parameter table and mechanical drawing for dimensions, hole geometry, fits and machining decisions.

Exact-SKU Interface Cross-Reference

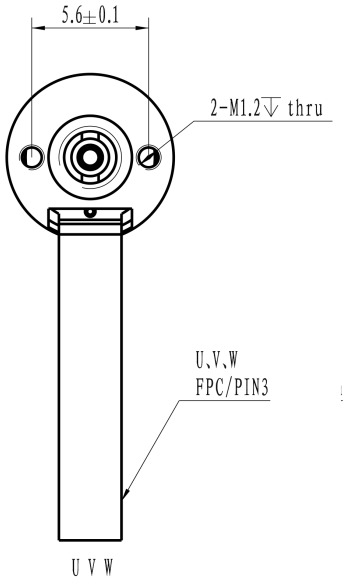
INTEGRATION TOPIC	EXACT-SKU REFERENCE
Motor envelope and output orientation	Motor Body Length: 25 mm. Confirm interface geometry, fits and installation details in the exact-SKU mechanical drawing.
Drive and motion boundaries	Rated Voltage: 12 V; Continuous Rated Current: 0.45 A; Rated Torque: 0.8 mN·m; Rated Speed: 38200 rpm. Confirm interface geometry, fits and installation details in the exact-SKU mechanical drawing.
Installed load and thermal reference	Rotor Inertia: 0.016 g·cm²; Weight: 7.3 g; Insulation Class: B; Duty Cycle: S2. Confirm interface geometry, fits and installation details in the exact-SKU mechanical drawing.

Product Structure & Views

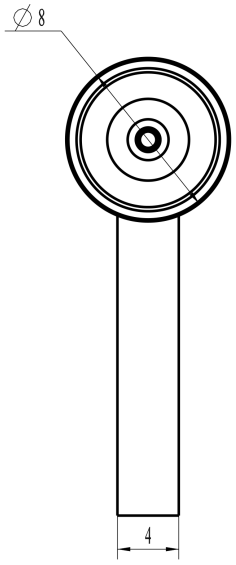
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



Mechanical View 1



Mechanical View 2



Mechanical View 3

VIEW	FIELD	VALUE
Mechanical View 1	Left mounting boss width	5.6±0.5 mm
	Overall length	25 mm
	Left step depth	1.8 mm
	Right end face length	0.5 mm
	Left shaft diameter	⌀10 0/-0.015 mm
	Left vertical dimension	7 0/-0.02 mm
	Right shaft diameter	⌀4 0/-0.02 mm
	Label area designation	Label
	Overall height	150±20 mm
Mechanical View 3	Center hole diameter	⌀8
	Shaft end diameter	4

Technical Specifications

PARAMETER	VALUE	UNIT
Rated Torque	0.8	mN·m
Rated Speed	38200	rpm
Continuous Rated Output Power	3.25	W
No-Load Rotational Speed	48000	rpm
Pole Pairs	1	
Peak Current	2	A
Torque Constant	1.77	mN·m/A
Continuous Rated Current	0.45	A
Insulation Class	B	
Dielectric strength	300VAC/1KHz/1mA/1s	VAC
Insulation Resistance	100 MΩ/300VDC	MΩ
No-load Current	0.056	A
Rated Voltage	12	V
Shaft material		
Weight	7.3	g
End-cap material		

Technical Specifications - Continued

PARAMETER	VALUE	UNIT
Mechanical Time Constant	3.11	ms
Rotor Inertia	0.016	g·cm²
Bearing type		
Peak torque	3.49	mN·m
Winding connection		
Back-EMF Constant (Peak)	0.26	V/Krpm
Magnet material	NdFeB	
Motor Body Length	25	mm
Housing-to-Ambient Thermal Resistance	12.52	K/W
Motor efficiency	60	%
Back-EMF constant (RMS)	0.19	V/Krpm
Line resistance	6.1	Ω
Maximum Winding Temperature	63	°C
Housing Type	T	
Line inductance	0.085	mH
Ambient temperature	22.3	°C

Technical Specifications - Continued

PARAMETER	VALUE	UNIT
Duty Cycle	S2	
Motor diameter	8	mm

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

- Coordinate supply, drive current limit, speed, torque and fault protection with the actual load and duty cycle.
- 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-CM-BL02-M001 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.