

ENGINEERING DOCUMENTATION

Rotary Servo Motor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SM-A03-040-TOP16NM-50W-003	DRAFT-08 / 27 Aug 2026	Engineering Integration Reference

Integration Overview

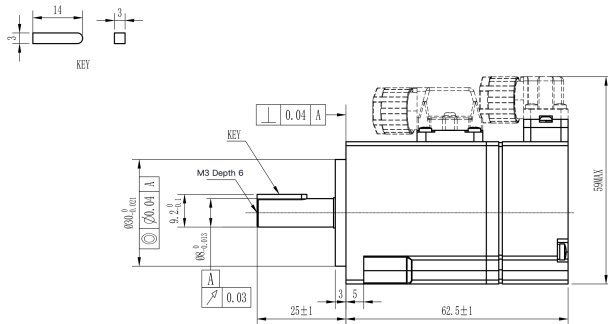
Closed-loop rotary servo motor for specified motion axes. This guide supports mechanical mounting, shaft and coupling integration, feedback and brake planning, cable routing, thermal validation and staged commissioning.

Key Integration Facts

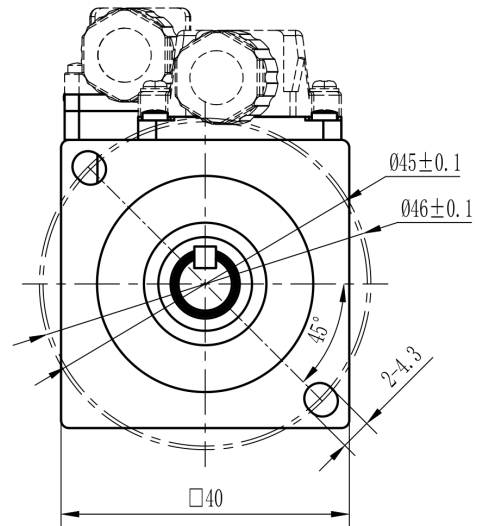
INTEGRATION ITEM	PUBLISHED VALUE
Rated Torque	0.16 Nm
Rated Speed	3000 rpm
Rated Voltage	220 VAC
Flange Size	40 mm

Product Structure & Views

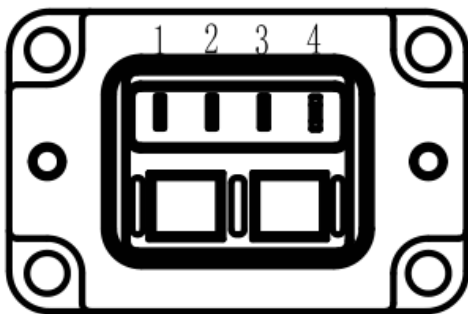
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



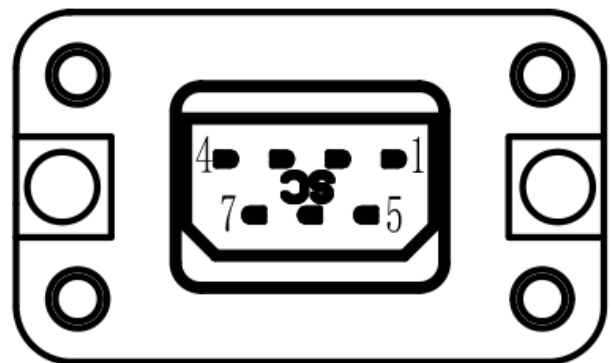
Mechanical View 1



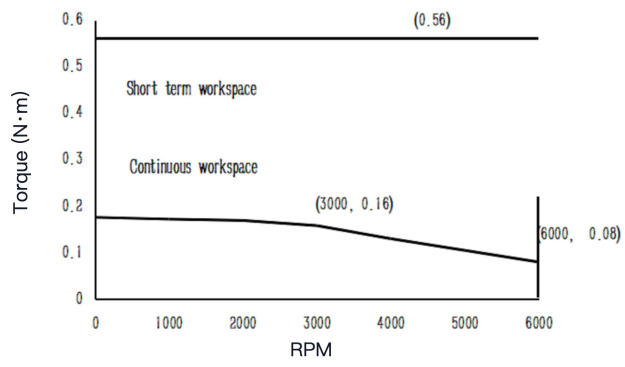
Mechanical View 2



Mechanical View 5



Mechanical View 8



Mechanical View 10

VIEW	FIELD	VALUE
Mechanical View 1	Key profile length	14 mm
	Key feature label	Key feature
	0.04 geometric tolerance relative to datum A	Geometric tolerance 0.04 to datum A
	Shaft key feature label	Key feature on shaft
	Threaded hole size and depth	M3 thread, depth 6 mm
	Maximum overall height	59 mm maximum
	Datum A	Datum A
	Diameter 0.04 geometric tolerance	Cylindrical tolerance zone diameter 0.04 mm
	Main shaft diameter	Diameter 30 mm, +0 / -0.021 mm
	Keyway related dimension	9.2 mm, +0 / -0.1 mm
	Small shaft diameter	Diameter 8 mm, +0 / -0.013 mm
	Datum A	Datum A on shaft feature
	0.03 geometric tolerance	Geometric tolerance 0.03 mm
	Bottom step width	3 mm
	Main body length	62.5 ± 1 mm
	Shaft extension length	25 ± 1 mm
	End step offset dimension	5 mm
	Key width	3 mm
Mechanical View 2	Locating diameter	Diameter 45 ±0.1
	Outer locating diameter	Diameter 46 ±0.1
	Mounting hole angular position	45 degrees
	Square mounting face side length	Square 40
	Mounting Hole Diameter	2-Ø4.3
Mechanical View 5	Connector pin numbering	Pins numbered 1, 2, 3, 4
Mechanical View 8	Connector pin number	Pin label: 4
	Connector pin number	Pin label: 7
	Connector pin number	Pin label: 1
	Connector pin number	Pin label: 5
Mechanical View 10	Y-axis torque unit	Torque in N·m
	X-axis speed unit	Rotational speed in rpm
	Short term workspace label	Short term operating region
	Continuous workspace label	Continuous operating region
	Short term maximum torque reference	Upper graph limit 0.6 Nm with reference value 0.56 Nm
	Continuous torque curve point	3000 rpm, 0.16 Nm
	Maximum speed continuous torque point	6000 rpm, 0.08 Nm
	Torque scale tick values	Y-axis ticks: 0 to 0.6 Nm in 0.1 increments

VIEW	FIELD	VALUE
Speed scale tick values	X-axis ticks: 0 to 6000 rpm in 1000 rpm increments	

Overall Dimensions and Mounting Interface

PARAMETER	PUBLISHED VALUE	UNIT
Flange Size	40	mm

- Confirm the mounting face, locating feature, shaft geometry, fastener engagement and removal clearance against the applicable exact-SKU drawing.
- Mount the motor on a flat, rigid interface and avoid using fasteners to pull a misaligned assembly into position.

Shaft, Coupling and Load Path

PARAMETER	PUBLISHED VALUE	UNIT
Rotor Inertia	0.025 ()	Kg-cm ²

- Align the driven shaft and coupling before tightening; validate radial, axial and moment loads against applicable bearing-load data.
- Do not hammer, uncontrolled press-fit or transmit installation force through the motor bearings.

Electrical, Feedback and Brake Integration

PARAMETER	PUBLISHED VALUE	UNIT
Rated Voltage	220	VAC
Position Feedback Device	23-bit multi-turn communication optical absolute encoder	

- Use only the current winding, feedback, brake and connector definitions for this exact SKU.
- Verify drive compatibility, polarity, current limits, feedback direction and brake sequencing before enabling torque.

Thermal, Duty and Environmental Conditions

PARAMETER	PUBLISHED VALUE	UNIT
Rated Torque	0.16	Nm
Operating Temperature	-20 40	°C

- Validate winding and housing temperature under the installed duty cycle, ambient condition, mounting heat path and enclosure airflow.
- Published peak values are transient boundaries and must not be treated as continuous operating ratings.

Cable Routing, Grounding and EMC

PARAMETER	PUBLISHED VALUE	UNIT
Position Feedback Device	23-bit multi-turn communication optical absolute encoder	

- Provide strain relief and bend radius through the full machine motion envelope.
- Separate motor power, brake and feedback wiring and terminate shields according to the specified system grounding architecture.

Commissioning and Motion Validation

PARAMETER	PUBLISHED VALUE	UNIT
Rated Speed	3000	rpm
Rated Torque	0.16	Nm

- Commission at low energy with the transmission unloaded or safely restrained, then confirm direction, feedback polarity, brake final integration, current limit and fault response.
- Validate the complete axis through intended acceleration, speed, load, stop and fault cycles during integration planning.

Integration Checklist

- | | |
|----|--|
| 01 | Confirm the exact SKU, 2D drawing and applicable wiring data. |
| 02 | Verify mounting, shaft, coupling, alignment, fasteners and removal clearance. |
| 03 | Validate radial and axial loads, inertia, acceleration and credible shock cases. |
| 04 | Confirm drive, winding, feedback, brake and connector compatibility. |
| 05 | Set current, speed, acceleration and thermal limits from the installed duty cycle. |
| 06 | Verify cable routing, shielding, grounding, strain relief and bend radius. |
| 07 | Commission at low energy before validating the full machine cycle. |

[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-SM-A03-040-TOP16NM-50W-003 and is intended for dimensional evaluation and preliminary integration. It is not a applicable manufacturing drawing, wiring definition, application approval, machinery risk assessment, safety validation or integration planning document. Before design freeze, machining, wiring or energization, verify all dimensions, tolerances, mounting and locating features, load boundaries, electrical interfaces, thermal conditions, cabling, grounding, protection, commissioning and applicable regulatory requirements against the applicable EmbodyStack engineering data for this exact SKU. Where this guide and applicable product documentation differ, the applicable product documentation governs. Validate the complete installed system under intended duty cycles, loads, accelerations, environmental conditions and credible fault cases.