

ENGINEERING DOCUMENTATION

Rotary Servo Motor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SM-A01-040S-TOP16NM-50W-004	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

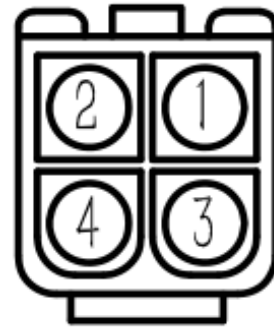
INTEGRATION ITEM	PUBLISHED VALUE
Rated Torque	0.16 Nm
Rated Speed	3000 rpm
Flange Size	40 mm

Product Structure & Views

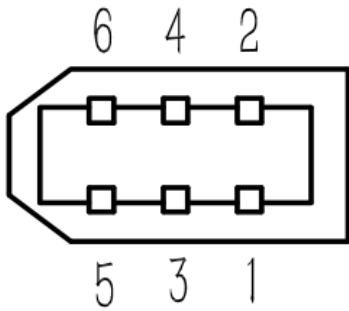
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



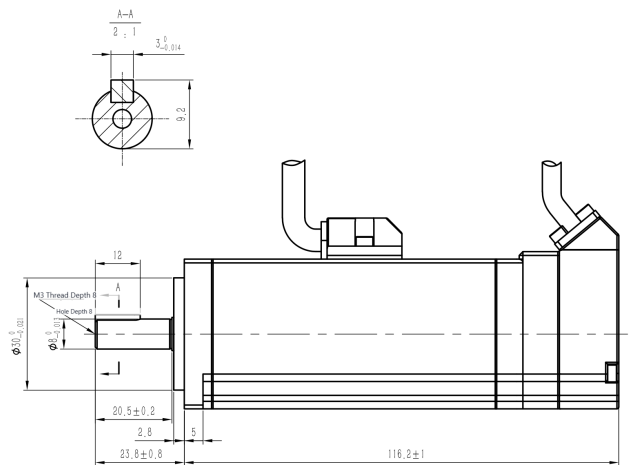
Mechanical View 1



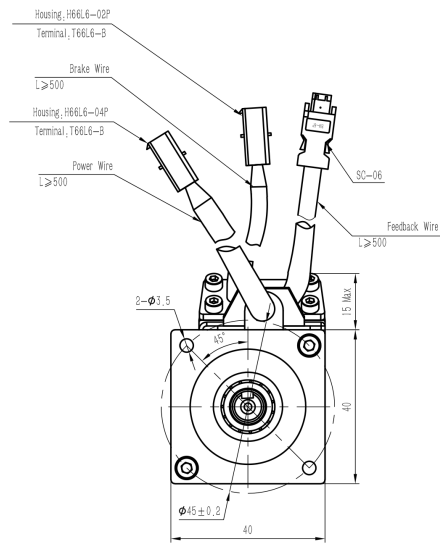
Mechanical View 5



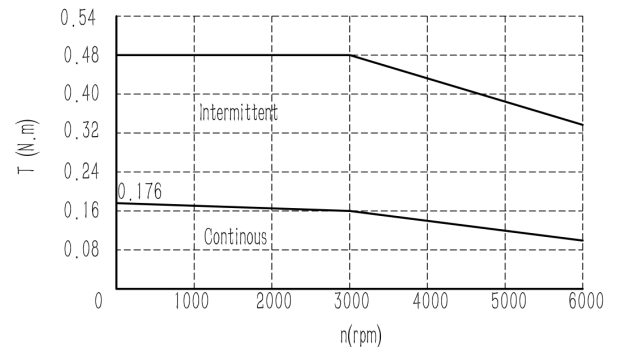
Mechanical View 6



Mechanical View 7



Mechanical View 8



Mechanical View 11

VIEW	FIELD	VALUE
Mechanical View 1	Connector terminal/cavity number	Connector cavity/pin label 2
	Encoder connector pin number	Pin 1
Mechanical View 5	Connector cavity/pin number	Connector cavity/pin position 2
	Connector cavity/pin number	Connector cavity/pin position 3
	Connector pin number 1	Pin 1
	Connector pin number 4	Pin 4
Mechanical View 6	Connector pin numbers, upper row	6 4 2
	Connector pin numbers, lower row	5 3 1
Mechanical View 7	Section view label	Section A-A
	Detail view scale	Scale 2:1
	Keyway width	3 mm +0/-0.014
	Keyway radial dimension	9.2 mm
	Shaft end length	12 mm
	Datum A	Datum A
	End threaded hole	M3 thread, depth 8 mm
	Hole depth	Hole depth 8 mm
	Shaft end diameter	Diameter 8 mm +0/-0.013
	Body locating diameter	Diameter 30 mm +0/-0.021
	Shaft shoulder to end length	20.5 mm ±0.2
	Step width	5 mm
	Relief or spacing width	2.8 mm
	Total shaft protrusion length	23.8 mm ±0.8
	Motor body length	116.2 mm ±1
Mechanical View 8	Brake wire length	Brake wire length L >= 500 mm
	Power wire length	Power wire length L >= 500 mm
	Feedback wire length	Feedback wire length L >= 500 mm
	Maximum top cable/connector protrusion height	15 mm maximum
	Mounting hole quantity and diameter	2 holes, diameter 3.5 mm
	Mounting hole angular position	45 degrees
	Vertical mounting hole spacing	40 mm
	Mounting hole pitch circle diameter	Diameter 45 mm ±0.2 mm
	Horizontal mounting hole spacing	40 mm
Mechanical View 11	Torque axis tick 0.54	Torque scale tick: 0.54 N.m
	Torque axis tick 0.48	Torque scale tick: 0.48 N.m
	Torque axis tick 0.40	Torque scale tick: 0.40 N.m
	Intermittent operation curve	Intermittent torque-speed characteristic curve label

VIEW	FIELD	VALUE
Torque axis tick 0.32	Torque scale tick: 0.32 N.m	
Torque axis label	Vertical axis: torque T in N.m	
Torque axis tick 0.24	Torque scale tick: 0.24 N.m	
Continuous curve starting torque callout	Continuous curve callout: 0.176 N.m	
Torque axis tick 0.16	Torque scale tick: 0.16 N.m	
Continuous operation curve	Continuous torque-speed characteristic curve label	
Torque axis tick 0.08	Torque scale tick: 0.08 N.m	
Speed axis tick 0	Speed scale tick: 0 rpm	
Speed axis tick 1000	Speed scale tick: 1000 rpm	
Speed axis tick 2000	Speed scale tick: 2000 rpm	
Speed axis tick 3000	Speed scale tick: 3000 rpm	
Speed axis tick 4000	Speed scale tick: 4000 rpm	
Speed axis tick 5000	Speed scale tick: 5000 rpm	
Speed axis tick 6000	Speed scale tick: 6000 rpm	
Rotational speed axis label	Horizontal axis: rotational speed n in rpm	

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	0.021	kgcm 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
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-A01-040S-TOP16NM-50W-004 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.