ENGINEERING DOCUMENTATION

# Rotary Servo Motor

Dimensional & Integration Guide

| DOCUMENT | REVISION / ISSUE | STATUS |
| --- | --- | --- |
| DIG-ES-SM-L02-080D-V48-T3P18NM-1000W-002 | DRAFT-08 / 27 Aug 2026 | Engineering Integration Reference |

## Integration Overview

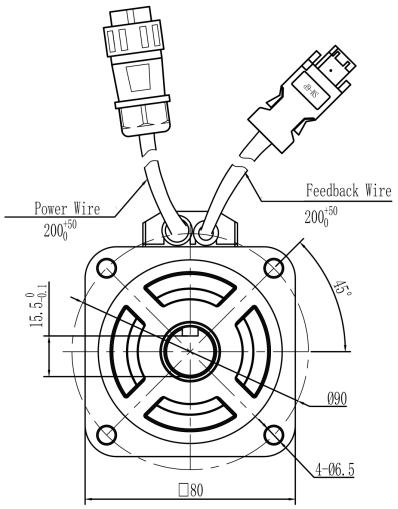
Closed-loop rotary servo motor for specified motion axes. This guide supports mechanical mounting, shaft and coupling integration, feedback and brake planning, cable routing, thermal validation and staged commissioning.

## Key Integration Facts

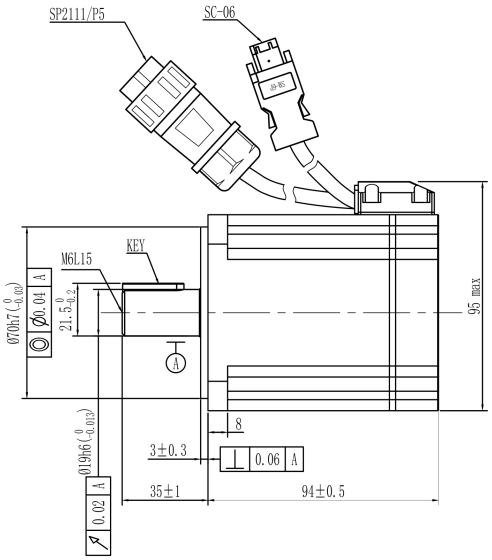
| INTEGRATION ITEM | PUBLISHED VALUE |
| --- | --- |
| Rated Torque | 3.18 N·m |
| Rated Speed | 3000 rpm |
| Rated Voltage | 48 VDC |
| Flange Size | 80 mm |

# Product Structure & Views

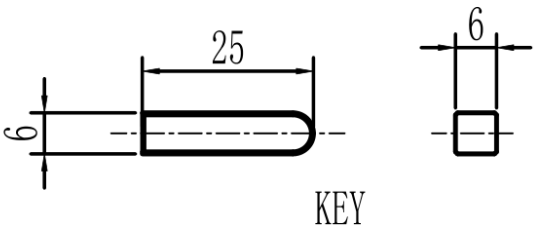
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



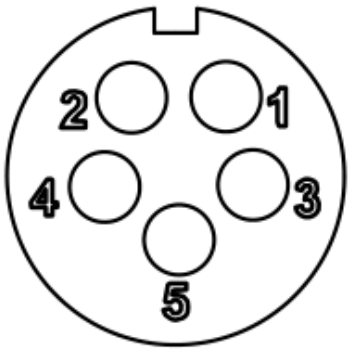

Mechanical View 1



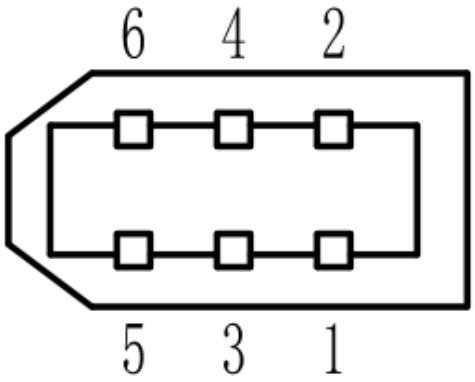

Mechanical View 2



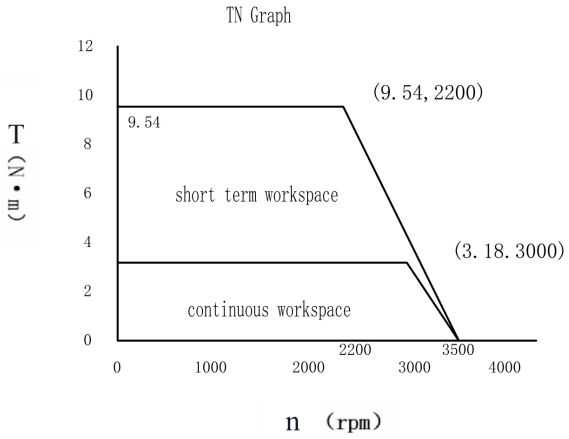

Mechanical View 3




Mechanical View 5




Mechanical View 7




Mechanical View 9

| VIEW | FIELD | VALUE |
|---|---|---|
| Mechanical View 1 | Power wire cable length | 200 +50 mm |
| | Feedback wire cable length | 200 +50 mm |
| | Flange square dimension | 80 × 80 mm square |
| | Mounting hole diameter and quantity | 4 holes × Ø6.5 mm |
| | Mounting hole circle diameter | Ø90 mm PCD |
| | Shaft extension length with tolerance | 15.5 -0.1 mm |
| | Angular dimension | 45° |
| Mechanical View 2 | Keyway designation | Keyway present |
| | Mounting thread M6L15 | M6×15 thread |
| | Shaft diameter with tolerance | Ø70h7 (0/-0.03) |
| | Position tolerance | Position 0.04 relative to datum A |
| | Shaft shoulder height | 21.5 -0.2/0 |
| | Shaft diameter with tolerance | Ø19h6 (0/-0.013) |
| | Shaft segment length | 3±0.3 |
| | Perpendicularity tolerance | Perpendicularity 0.06 relative to datum A |
| | Shaft segment length | 35±1 |
| | Overall length | 94±0.5 |
| | Perpendicularity tolerance | Perpendicularity 0.02 relative to datum A |
| | Datum A | Datum A |
| | Maximum height | 95 max |
| | Dimension value | 8 |
| Mechanical View 3 | Key length | 25 |
| | Key width | 6 |
| | Keyway designation | KEY |
| | Keyway width | 6 |
| Mechanical View 5 | Connector Pin 1 | Pin 1 |
| | Connector Pin 2 | Pin 2 |
| | Connector Pin 3 | Pin 3 |
| | Connector Pin 5 | Pin 5 |
| | Connector Pin 4 | Pin 4 |
| Mechanical View 7 | Connector Pin 6 | Pin 6 |
| | Connector Pin 4 | Pin 4 |
| | Connector Pin 2 | Pin 2 |
| | Connector Pin 5 | Pin 5 |
| | Connector Pin 3 | Pin 3 |
| | Connector Pin 1 | Pin 1 |

| VIEW | FIELD | VALUE |
|---|---|---|
| Mechanical View 9 | Chart Title | TN Graph (Torque-Speed Curve) |
| | Y-Axis Label: Torque | T (N·m) |
| | X-Axis Label: Speed | n (rpm) |
| | Short-term Working Zone Knee Point | T = 9.54 N·m @ n = 2200 rpm |
| | Continuous Working Zone Knee Point | T = 3.18 N·m @ n = 3000 rpm |
| | Peak Torque Annotation | 9.54 N·m (peak / short-term torque) |
| | Short-term Working Zone Label | Short-term working zone |
| | Continuous Working Zone Label | Continuous working zone |
| | Y-Axis Scale Values | 0, 2, 4, 6, 8, 10, 12 N·m |
| | X-Axis Scale Values | 0, 1000, 2000, 2200, 3000, 3500, 4000 rpm |

## Overall Dimensions and Mounting Interface

| PARAMETER | PUBLISHED VALUE | UNIT |
|---|---|---|
| Flange Size | 80 | 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 | 2.2 / 2.04 | Kg·cm2 |

- 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 | 48 | VDC |

- 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 | 3.18 | N·m |
| Operating Temperature | -5 to 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

- 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 | 3.18 | N·m |

- 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-L02-080D-V48-T3P18NM-1000W-002 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.