

## ENGINEERING DOCUMENTATION

# Rotary Servo Motor

## Dimensional &amp; Integration Guide

| DOCUMENT                           | REVISION / ISSUE       | STATUS                            |
|------------------------------------|------------------------|-----------------------------------|
| DIG-ES-SM-A02-180D-T48NM-7500W-001 | DRAFT-08 / 27 Aug 2026 | Engineering Integration Reference |

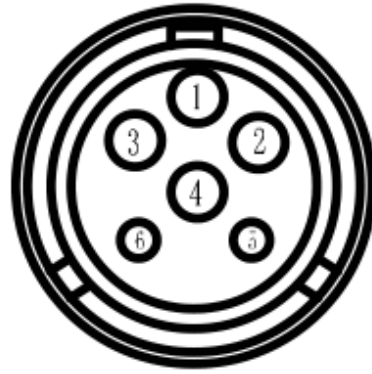
## Integration Overview

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.

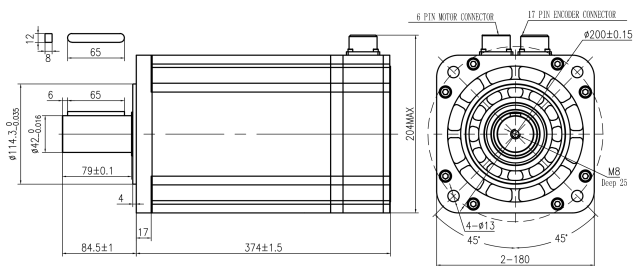
## Key Integration Facts

| INTEGRATION ITEM | PUBLISHED VALUE |
|------------------|-----------------|
| Rated Torque     | 48 Nm           |
| Rated Speed      | 1500 rpm        |
| Flange Size      | 180 mm          |

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



### Mechanical View 4



The graph shows the torque-speed characteristics for a 4-pole motor. The y-axis represents torque  $\tau$  in N.m, ranging from 0 to 140. The x-axis represents speed  $n$  in rpm, ranging from 0 to 3000. Two operating regions are defined: 'Intermittent' and 'Continuous'. The intermittent region has a maximum torque of 132 N.m at 1500 rpm. The continuous region has a maximum torque of 52.8 N.m at 1500 rpm. Both regions show a linear decrease in torque as speed increases, with the intermittent region having a steeper slope. The intermittent region ends at 2300 rpm, and the continuous region ends at 2300 rpm.

| Region       | Speed $n$ (rpm) | Torque $\tau$ (N.m) |
|--------------|-----------------|---------------------|
| Intermittent | 1500            | 132                 |
|              | 2300            | 0                   |
| Continuous   | 1500            | 52.8                |
|              | 2300            | 0                   |

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| VIEW              | FIELD                                    | VALUE                        |
|-------------------|------------------------------------------|------------------------------|
| Mechanical View 2 | Connector pin label 1-17                 | Pin 1-17                     |
| Mechanical View 4 | Pin Number 1                             | Pin 1 - Top center position  |
|                   | Pin Number 2                             | Pin 2 - Right upper position |
|                   | Pin Number 3                             | Pin 3 - Left upper position  |
|                   | Pin Number 4                             | Pin 4 - Center position      |
|                   | Pin Number 5                             | Pin 5 - Right lower position |
|                   | Pin Number 6                             | Pin 6 - Left lower position  |
| Mechanical View 6 | Encoder connector                        | 17-pin encoder connector     |
|                   | Motor connector                          | 6-pin motor connector        |
|                   | Mounting flange diameter                 | Ø200±0.15                    |
|                   | Shaft extension length                   | 12                           |
|                   | Motor body length                        | 65                           |
|                   | Keyway to shaft end distance             | 8                            |
|                   | Keyway length                            | 6                            |
|                   | Secondary section length                 | 65                           |
|                   | Shaft mounting section outer diameter    | Ø14.3 0/-0.035               |
|                   | Output shaft diameter                    | Ø20/-0.016                   |
|                   | Maximum overall length                   | 204 max                      |
|                   | Flange mounting width 1                  | 79±0.1                       |
|                   | Mounting thread specification            | M8                           |
|                   | Mounting hole depth                      | 25 deep                      |
|                   | Number of keyways/features               | 4                            |
|                   | Mounting hole specification and quantity | 4-Ø3                         |
|                   | Connector mounting section length        | 17                           |
|                   | Mounting hole angular position 1         | 45°                          |
|                   | Mounting hole angular position 2         | 45°                          |
|                   | Flange mounting width 2                  | 84.5±1                       |
|                   | Overall length                           | 374±1.5                      |
|                   | Bolt circle diameter                     | 2-180                        |
| Mechanical View 7 | Y-axis label - Torque                    | T (N.m)                      |
|                   | X-axis label - Speed                     | n (rpm)                      |
|                   | Intermittent maximum torque              | 132 N.m                      |
|                   | Continuous maximum torque                | 52.8 N.m                     |
|                   | Intermittent operation transition speed  | 48 rpm                       |
|                   | Maximum speed                            | 2300 rpm                     |
|                   | Curve label - Intermittent operation     | Intermittent                 |

| VIEW                               | FIELD                     | VALUE |
|------------------------------------|---------------------------|-------|
| Curve label - Continuous operation | Continuous                |       |
| Speed axis label                   | Rotational speed n in rpm |       |
| Torque Scale                       | 0-140 Nm                  |       |
| Motor Speed Scale                  | 0-3000 rpm                |       |

## Overall Dimensions and Mounting Interface

| PARAMETER   | PUBLISHED VALUE | UNIT |
|-------------|-----------------|------|
| Flange Size | 180             | 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 | 190             | kgcm <sup>2</sup> |

- 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 | S-MT37 rotary transformer |      |

- 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          | 48              | 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 | S-MT37 rotary transformer |      |

- 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  | 1500            | rpm  |
| Rated Torque | 48              | 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.

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## 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.                 |

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[View SKU Product Datasheet](#)   [Request controlled 2D drawing](#)   [Request controlled STEP review](#)   [Request a Quote](#)

### Engineering Use and Verification Notice

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**01.** This Dimensional & Integration Guide applies only to EmbodyStack SKU ES-SM-A02-180D-T48NM-7500W-001 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.