

ENGINEERING DOCUMENTATION

Frameless Torque Motor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-FM-H01-OD115-T3P5NM-001	DRAFT-08 / 27 Aug 2026	Engineering Integration Reference

Integration Overview

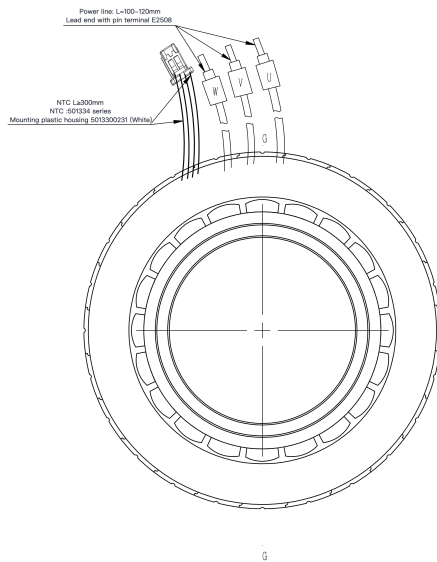
Frameless torque motor for direct integration into a host rotary assembly. This guide supports rotor-stator alignment, air-gap control, bearing and load-path design, thermal extraction, electrical integration and staged commissioning.

Key Integration Facts

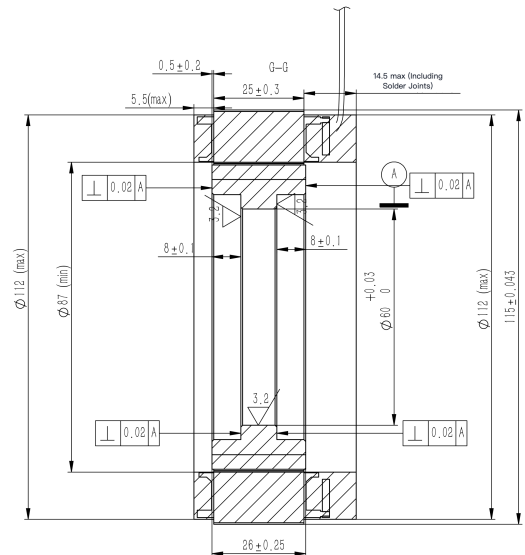
INTEGRATION ITEM	PUBLISHED VALUE
Rated Torque	3.5 Nm
Rated Speed	3200 rpm
Weight	1.38 kg

Product Structure & Views

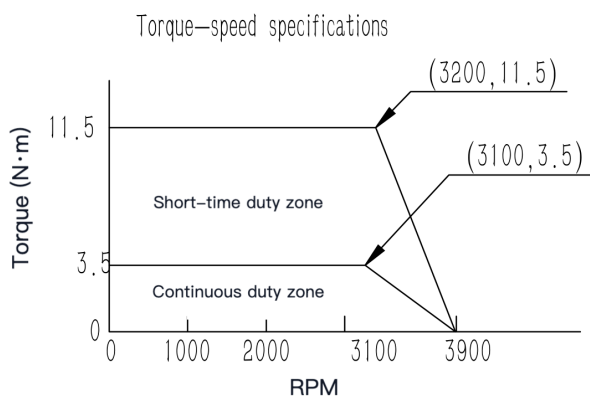
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



Mechanical View 1



Mechanical View 2



Mechanical View 6

VIEW	FIELD	VALUE
Mechanical View 1	Power line length	L = 100-120 mm
	Lead end terminal type	pin terminal E2508
	NTC lead length	L ≥300 mm
	NTC terminal series	501334 series
	Mounting housing part number	5013300231 (White)
	Wire identifier	G
	WVU phase power wire label	WVU phase label
Mechanical View 2	Maximum height including solder joints	14.5 max including solder joints
	Upper mounting step width	25 ±0.3
	Maximum edge clearance	5.5 max
	Upper right face perpendicularity to datum A	Perpendicularity 0.02 to datum A
	Upper left face perpendicularity to datum A	Perpendicularity 0.02 to datum A
	Left internal slot width	8 ±0.1
	Left maximum outer diameter	Diameter 112 max
	Right maximum outer diameter	Diameter 112 max
	Central bore diameter tolerance	Diameter 60 +0.03/0
	Datum A	Datum A
	Surface roughness value	Surface roughness Ra 3.2
	Lower left face perpendicularity to datum A	Perpendicularity 0.02 to datum A
	Lower right face perpendicularity to datum A	Perpendicularity 0.02 to datum A
	Bottom interface width	26 ±0.25
	Overall outside diameter tolerance	Diameter 115 ±0.043
	Minimum inner diameter	Diameter 87 min
	Top Step Distance	0.5 ± 0.2 mm
	Section view identifier	G-G
	Right internal slot width	8 ±0.1
	Surface Roughness	3.2
Mechanical View 6	Chart title	Torque-speed specifications
	Torque axis label	Torque in N·m
	Speed axis label	Speed in rpm
	Peak torque operating point	3200 rpm at 11.5 N·m
	Rated or continuous torque operating point	3100 rpm at 3.5 N·m
	Short-time duty zone	Short-time duty operating area
	Continuous duty zone	Continuous duty operating area
	Speed scale values	Speed ticks, 0 1000, 2000, 3100, 3900 rpm
	Torque scale value	Torque tick:, 0, 3.5 11.5 N·m

Overall Dimensions and Mounting Interface

- Confirm the stator, rotor, bore, axial stack, locating and retention geometry against the applicable exact-SKU drawing.
- The host housing and shaft must provide the required datum control without distorting the active motor components.

Rotor, Stator and Air-Gap Alignment

- Control concentricity, axial position, runout and operating air gap through the complete tolerance and temperature range.
- Prevent contact, magnetic debris, impact and assembly forces from damaging the rotor or stator.

Bearing, Load Path and Retention

PARAMETER	PUBLISHED VALUE	UNIT
Rotor Inertia	5.97	kg·cm ²
Weight	1.38	kg

- The host bearing system must carry radial, axial and moment loads; do not infer bearing capability from motor torque or diameter.
- Provide positive rotor retention and verify overspeed, imbalance, shock and fault torque cases.

Electrical and Feedback Integration

PARAMETER	PUBLISHED VALUE	UNIT
Torque Constant	0.127	Nm/A

- Match the winding, drive current, voltage, commutation and feedback system to the exact SKU.
- Use current phase, sensor and insulation definitions; do not infer pin or phase identity from this guide.

Thermal Path and Duty Cycle

PARAMETER	PUBLISHED VALUE	UNIT
Rated Torque	3.5	Nm

- Design a verified heat path from the stator into the host structure and validate temperatures under the intended duty cycle.
- Peak torque and current are transient boundaries and require coordinated drive protection.

Assembly and Commissioning Validation

PARAMETER	PUBLISHED VALUE	UNIT
Rated Speed	3200	rpm
Rated Torque	3.5	Nm

- Check free rotation, air gap, retention, insulation and sensor alignment before energization.
- Commission at low energy, confirm commutation and direction, then validate the complete joint through intended load and fault cases.

Integration Checklist

- | | |
|----|--|
| 01 | Confirm the exact SKU, 2D package and applicable assembly data. |
| 02 | Verify stator, rotor, bore, stack, datums, retention and operating air gap. |
| 03 | Validate host bearings, shaft, housing stiffness, runout and thermal growth. |
| 04 | Confirm winding, drive, feedback, commutation and insulation compatibility. |
| 05 | Establish and validate the stator-to-housing thermal path. |
| 06 | Check free rotation and insulation before low-energy commissioning. |
| 07 | Validate full load, speed, temperature and credible fault cases. |

[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-FM-H01-OD115-T3P5NM-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.