

ENGINEERING DOCUMENTATION

Frameless Torque Motor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-FM-U01-OD132-TTBDNM-001	DRAFT-08 / 27 Aug 2026	Engineering Integration Reference

Integration Overview

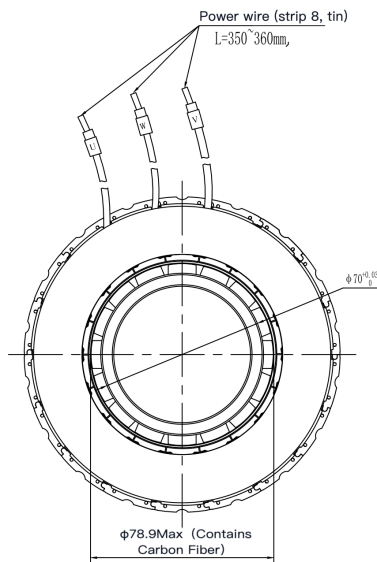
Frameless torque motor for direct integration into a host rotary assembly. This guide supports rotor-stator alignment, air-gap control, bearing and load-path design, thermal extraction, electrical integration and staged commissioning.

Key Integration Facts

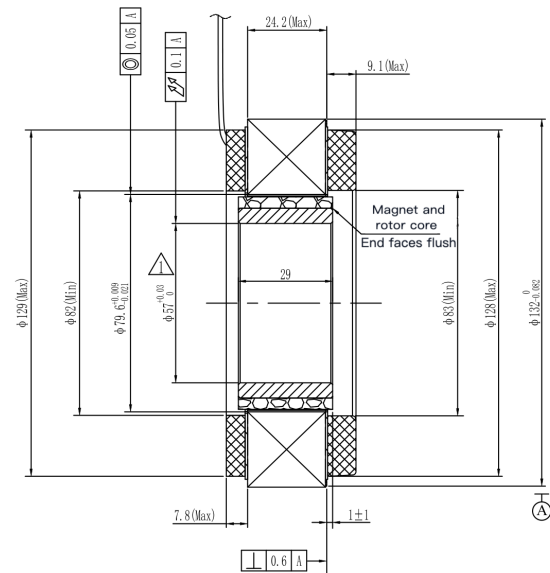
INTEGRATION ITEM	PUBLISHED VALUE
Rated Torque	3.5 Nm
Rated Speed	3200 rpm
Body Outer Diameter	132 mm
Rotor Inner Diameter	43 mm
Axial Stack Length	24 mm

Product Structure & Views

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



Mechanical View 1



Mechanical View 2

VIEW	FIELD	VALUE
Mechanical View 1	Parameter	Specification
	Power wire specification	Strip 8mm, tin plated
	Power wire length	350~360mm
	U-phase wire label	U
	W-phase wire label	W
	Mounting hole diameter	Φ0 +0.03/0
	Maximum outer diameter (including carbon fiber)	Φ8.9 Max (including carbon fiber)
	Label P	P
	V-phase wire label	V
Mechanical View 2	Concentricity tolerance relative to datum A	Concentricity 0.05 A
	Angularity tolerance relative to datum A	Angularity 0.1 A
	Upper envelope width maximum	24.2 Max
	Right side envelope width maximum	9.1 Max
	Rotor assembly note	Magnet and rotor core end faces flush
	Rotor core length	29
	Left outer diameter maximum	Φ29 Max
	Left inner diameter minimum	Φ2 Min
	Rotor shaft outer diameter with tolerance	Φ9.6 +0.009/-0.021
	Center bore diameter with tolerance	Φ7 +0.03/0
	Right inner diameter minimum	Φ3 Min
	Right outer diameter maximum	Φ28 Max
	Maximum outer diameter with tolerance	Φ82 -0.082/0
	Lower envelope width maximum	7.8 Max
	Center offset tolerance	1±1
	Perpendicularity tolerance relative to datum A	Perpendicularity 0.6 A

Overall Dimensions and Mounting Interface

PARAMETER	PUBLISHED VALUE	UNIT
Body Outer Diameter	132	mm
Rotor Inner Diameter	43	mm
Axial Stack Length	24	mm

- 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

PARAMETER	PUBLISHED VALUE	UNIT
Rotor Inner Diameter	43	mm

- 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

- 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	0.132	Nm/A
Number of Pole Pairs	8 pole pairs	

- 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-U01-OD132-TTBDNM-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.