

ENGINEERING DOCUMENTATION

Joint Torque Sensor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SN-C18-S002-V002	DRAFT-08 / 25 Aug 2026	Engineering Integration Reference

Integration Overview

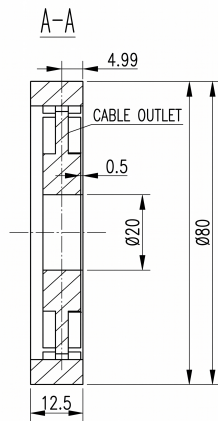
Compact flange-type torque sensing component for robot-joint feedback, load monitoring and research instrumentation. This guide supports mechanical load-path definition, analog signal integration and installed-system commissioning for ES-SN-C18-S002-V002.

Key Integration Facts

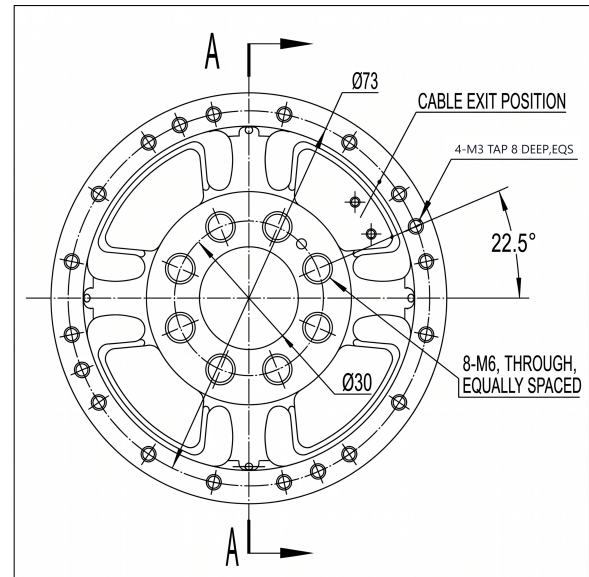
INTEGRATION ITEM	PUBLISHED VALUE
Measuring Range	180 Nm
Body Outer Diameter	80 mm
Overall Thickness	12.5 mm
Weight	282 g
Measurement Accuracy	0.2 %FS
Measurement Resolution	0.06 %FS
Overload Capacity	350 %FS
Recommended Supply Voltage	6 VDC

Product Structure & Views

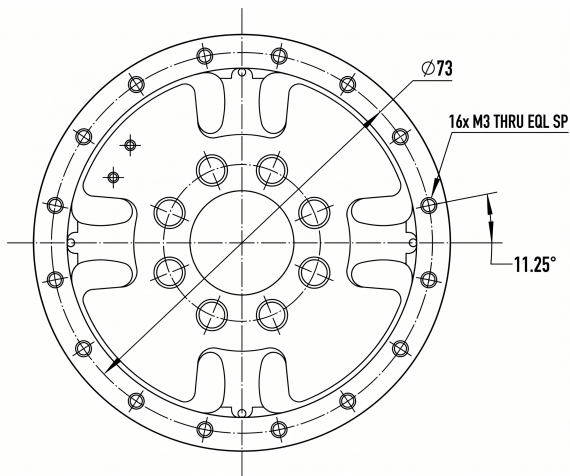
These views present product structure, mounting interfaces and relevant integration geometry for this SKU.



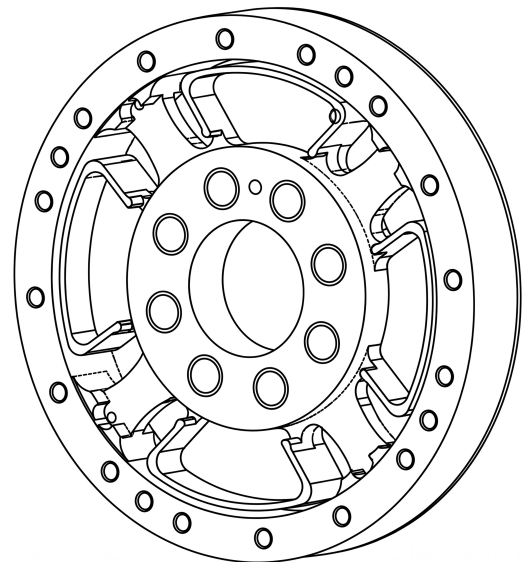
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

Overall Dimensions and Mounting Interface

PARAMETER	PUBLISHED VALUE	UNIT
Body Outer Diameter	80	mm
Overall Thickness	12.5	mm
Weight	282	g
Material	Alloy steel	

- Keep the mating flange faces flat, clean and aligned so the torque load passes through the intended joint axis.
- Use only the exact fastener pattern, engagement and tightening sequence defined by applicable product documentation. Apply thread locking only when approved for the host materials and service process.
- Avoid forced fit, flange distortion and installation preload that can shift the unloaded output or consume the published parasitic-load capacity.

Load Path and Torque Axis

PARAMETER	PUBLISHED VALUE	UNIT
Measuring Range	180	N·m
Axial Load Capacity	±500	N
Radial Load Capacity	±500	N
Bending Moment Capacity	±50	N·m

- Establish the torque axis, positive direction and signal polarity from the exact applicable product documentation and calibration data. Do not transfer a coordinate convention from another sensor architecture.

Published Load Boundaries

LOAD CASE	PUBLISHED LIMIT	INTEGRATION REQUIREMENT
Rated torque	180 N·m	Validate the complete flange and host load path against this exact-SKU limit.
Axial load	±500 N	Validate the complete flange and host load path against this exact-SKU limit.
Radial load	±500 N	Validate the complete flange and host load path against this exact-SKU limit.
Bending moment	±50 N·m	Validate the complete flange and host load path against this exact-SKU limit.
Torque overload	350 %FS	Validate the complete flange and host load path against this exact-SKU limit.

Torque Measurement Envelope

PARAMETER	PUBLISHED VALUE	UNIT
Measuring Range	180	Nm
Overload Capacity	350	%FS
Torsional Stiffness	186500	Nm/rad
Measurement Resolution	0.06	%FS
Measurement Accuracy	0.2	%FS
Measurement Repeatability	0.1	%FS
Nonlinearity	0.1	%FS
Orthogonality Error	1	%FS
Zero Drift	0.008	%FS
Temperature Zero Drift	0.005	%FS/10°C

- After any torque or parasitic-load event near or above the published limits, remove the load and verify zero, repeatability and response before returning the assembly to service.

Electrical Interface and Cable

PARAMETER	PUBLISHED VALUE	UNIT
Recommended Supply Voltage	6	VDC
Sensitivity	1.45±0.02	mV/V
Input Impedance	700	Ω
Output Impedance	700	Ω

- Before energizing the assembly, verify excitation voltage, polarity, signal pair assignment and return path against the applicable wiring data.
- Terminate shielding and grounding through the qualified host architecture, and separate low-level measurement wiring from switching power and motor conductors.
- Provide cable slack and strain relief so robot motion cannot pull on the sensor body or bias the torque measurement.

Installation and Signal Commissioning

- Complete final mechanical assembly, remove external load and allow the measurement chain to stabilize before recording the installed zero or baseline.
- Apply a small known torque in each commanded direction and confirm signal polarity, scaling and host-axis mapping before closed-loop operation.
- Validate the complete flange, fastener, cable and host structure under rated torque and credible axial, radial and bending loads.

Integration Checklist

- | | |
|----|--|
| 01 | Confirm that the mechanical drawing, parameter set and wiring data all identify ES-SN-C18-S002-V002. |
| 02 | Verify both flange patterns, bore, locating features, overall diameter and thickness against the 2D data. |
| 03 | Confirm fastener grade, engagement, tightening sequence and any permitted locking method. |
| 04 | Align the host joint axis with the defined torque axis and prevent forced flange fit or installation preload. |
| 05 | Validate rated torque together with axial, radial and bending loads for the complete host load case. |
| 06 | Verify excitation voltage, polarity, signal wiring, shielding and measurement-chain input compatibility before power-up. |
| 07 | Provide cable slack and strain relief throughout the full robot motion envelope. |
| 08 | Record installed zero under an unloaded and stabilized condition. |
| 09 | Confirm torque polarity and scaling with a small known load before closed-loop commissioning. |
| 10 | Request current 2D, STEP, wiring and calibration data before design freeze. |

[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-SN-C18-S002-V002 and is intended for dimensional evaluation and preliminary integration. It is not a applicable manufacturing drawing and must not be used as the sole basis for machining, tooling, tolerance allocation, fastener final integration, wiring final integration, safety validation or integration planning. during integration planning, verify all dimensions, flange interfaces, locating features, torque-axis definition, rated and parasitic load limits, electrical excitation, signal polarity, cable configuration, environmental limits and calibration 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 host assembly under its intended loads, environment, duty cycle and applicable regulatory requirements.