

ENGINEERING DOCUMENTATION

Six Axis Force Sensor

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-SN-C30-S001-V009	DRAFT-08 / 25 Aug 2026	Engineering Integration Reference

Integration Overview

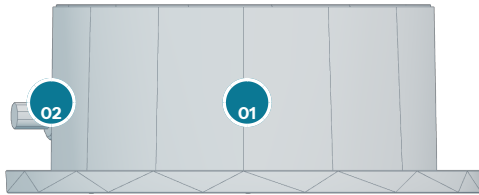
Six-axis force/torque sensing component for measuring three orthogonal force components and three orthogonal moment components. This guide supports mechanical layout, wiring planning and signal commissioning for ES-SN-C30-S001-V009.

Key Integration Facts

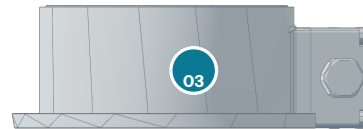
INTEGRATION ITEM	PUBLISHED VALUE
Dimensions	142 × 126 (diameter) × 50 mm
Mass	1450 g
Measurement Axes	6 axes
Force Range (Fxy)	3000 N
Force Range (Fz)	4000 N
Torque Range (Mxy)	150 Nm
Torque Range (Mz)	150 Nm
Communication Interface	Ethernet; EtherCAT; RS-485; analog output
Operating Temperature	-10 to +55 °C
Ingress Protection	IP65; IP67 customization available

Annotated 3D Orientation and Interface Views

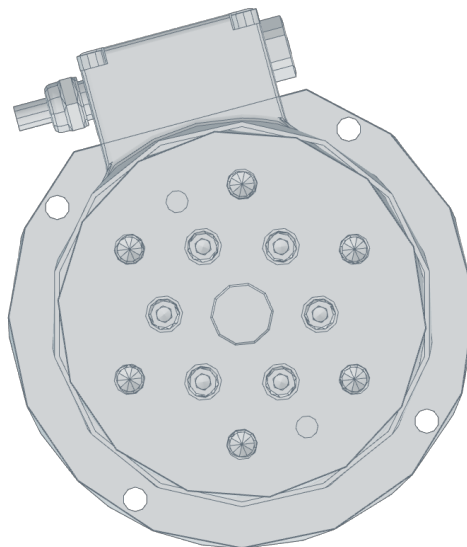
Orthographic 3D views identify the product body, primary interface and mounting relationships for ES-SN-C30-S001-V009.



Front View



Right Side View



Top View

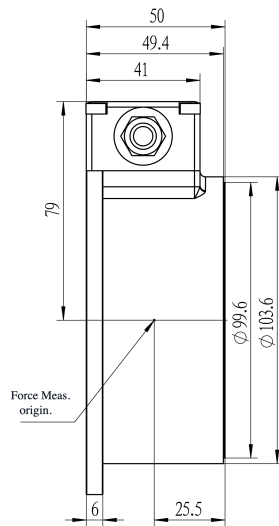
Numbered references identify the principal interfaces used by the integration sections.

Functional Callout Schedule

REF.	VIEW	INTEGRATION REFERENCE
01	Front View	Primary product envelope
02		Primary interface
03	Right Side View	Mounting and locating interface

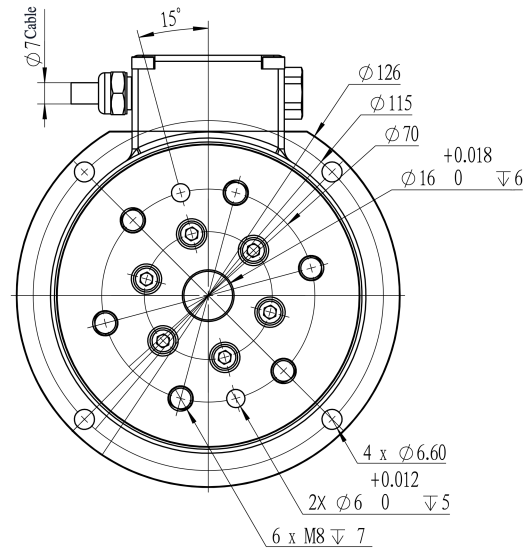
Product Structure & Views

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



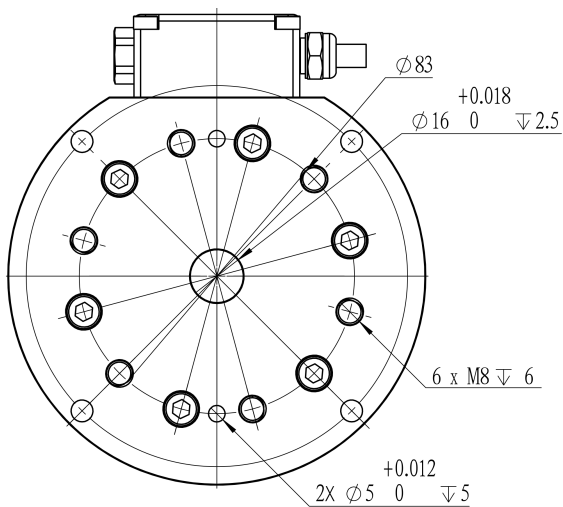
Side

Mechanical View 1



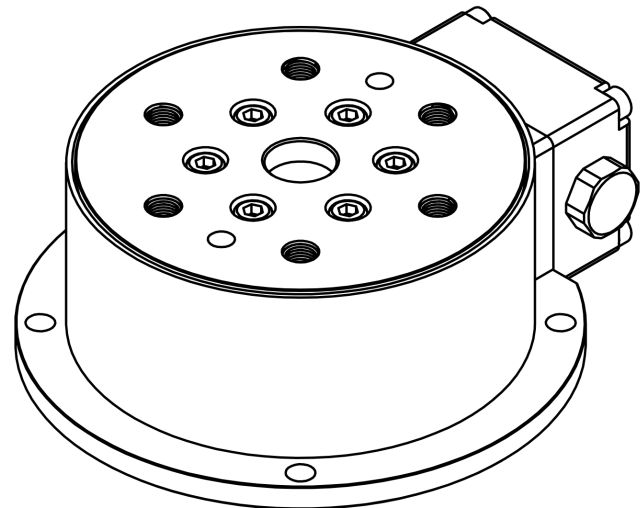
Front side

Mechanical View 2



Back Side

Mechanical View 3



Mechanical View 4

VIEW	FIELD	VALUE
Mechanical View 1	Top overall width	50 mm
	Top inner width	49.4 mm
	Top mounting block span	41 mm
	Left side height	79 mm
	Main body outside diameter	Diameter 99.6 mm
	Maximum outside diameter	Diameter 103.6 mm
	Left bottom thickness	6 mm
	Right bottom offset	25.5 mm
	View label	Side view
	Angular offset	15 degrees
Mechanical View 2	Outer diameter	Diameter 126
	Mounting bolt circle diameter	Diameter 115
	Inner feature circle diameter	Diameter 70
	Hole diameter with unilateral tolerance and depth	Diameter 16, tolerance +0.018/0, depth 6
	Four through-hole diameter	4 holes diameter 6.60
	Two holes diameter with unilateral tolerance and depth	2 holes diameter 6, tolerance +0.012/0, depth 5
	Threaded mounting holes and depth	6 threaded holes M8, depth 7
	View label	Front side view
	Outer diameter	Diameter 83
Mechanical View 3	Locating hole diameter and depth	Diameter 16, tolerance +0.018/0, depth 2.5
	Threaded mounting holes and depth	6 holes, M8 thread, depth 6
	Dowel/pin hole diameter and depth	2 holes, diameter 5, tolerance +0.012/0, depth 5
	View label	Back side view

Overall Dimensions and Mounting Interface

PARAMETER	PUBLISHED VALUE	UNIT
Dimensions	142 × 126 (diameter) × 50	mm
Mass	1450	g

- Mounting holes, locating features and face geometry are governed by the 2D views. Do not infer thread engagement, mounting torque or manufacturing tolerances from the overall envelope.

Load and Measurement Coordinate Frame

PARAMETER	PUBLISHED VALUE	UNIT
Measurement Axes	6	axes

- The measurement data set comprises Fx, Fy, Fz, Mx, My and Mz. Establish the host transform from the exact coordinate origin and axis directions in the applicable product documentation and calibration data.

Force/Torque Measurement Envelope

PARAMETER	PUBLISHED VALUE	UNIT
Force Range (Fxy)	3000	N
Force Range (Fz)	4000	N
Torque Range (Mxy)	150	N·m
Torque Range (Mz)	150	N·m
Resolution (Fxy)	0.02	%FS
Resolution (Fz)	0.02	%FS
Resolution (Mxy)	0.01	%FS
Resolution (Mz)	0.01	%FS
Nonlinearity	2	%FS
Axis Crosstalk	2	%FS
Overload Capacity	350	%

- Loads within the published overload capacity may still change sensor parameters. After an overload event, verify zero and measurement behavior before returning the assembly to service.

Connector, Cable and Data Interface

PARAMETER	PUBLISHED VALUE	UNIT
System Architecture	Digital output with adapter	
Communication Interface	Ethernet; EtherCAT; RS-485; analog output	
INTERFACE	CONNECTOR / PHYSICAL LAYER	AVAILABILITY / FUNCTION
Ethernet		
EtherCAT		
RS-485		
Analog output		
External Connector Type	Cold-pressed terminal	
Power Consumption	0.5	W
Maximum Output Data Rate	2000	Hz

- Select and qualify one output path for the ordered configuration. The published interface list represents available architecture choices and must not be interpreted as simultaneous native interfaces.
- Before energizing the assembly, verify power polarity, data-line assignment and shield termination against the applicable wiring documentation for the selected interface path.
- Provide strain relief and route the cable so that cable loads are not transferred into the sensing body or mounting interface.
- Qualify the required output rate with the selected interface and host acquisition path; use the published exact-SKU interface-specific limit where one is provided.

Operating and Ingress Conditions

PARAMETER	PUBLISHED VALUE	UNIT
Operating Temperature	-10 to +55	°C
Ingress Protection	IP65; IP67 customization available	

- The product ingress rating does not establish the protection rating of the complete host enclosure. Validate cable entry, mating interfaces and enclosure sealing in the final assembly.

Ingress Configuration Conditions

CONFIGURATION	PUBLISHED CONDITION	INTEGRATION REQUIREMENT
Standard configuration	IP65	Use this rating only for the exact standard SKU configuration and validate sealing in the final host assembly.
Custom ingress configuration	IP67 option available by confirmation	Do not assign IP67 to this SKU unless the ordered configuration and applicable product documentation explicitly confirm it.

Mounting & Signal Commissioning

- Align the mating faces and avoid installation preload, bending or forced fit that could bias the unloaded output.
- After power-up, allow 10–20 minutes for thermal stabilization before final zeroing or baseline recording.
- After mechanical installation and thermal stabilization, perform the supported zeroing procedure and confirm unloaded outputs before commissioning.

Integration Checklist

- | | |
|----|---|
| 01 | Confirm EmbodyStack SKU ES-SN-C30-S001-V009 and the exact 2D package before laying out the host interface. |
| 02 | Confirm the mounting face, hole pattern, locating features and required installation clearance. |
| 03 | Confirm that the host does not introduce preload, misalignment, bending or cable force into the sensing body. |
| 04 | Confirm the selected output architecture, power path, wiring assignment, grounding and shield strategy. |
| 05 | Confirm the required output rate against the published exact-SKU and interface-specific limits. |
| 06 | Confirm the operating temperature and the standard ingress condition for the ordered configuration. |
| 07 | Allow thermal stabilization, perform zeroing and record the unloaded baseline after installation. |
| 08 | Define an inspection and re-verification action after any overload event. |
| 09 | Request current 2D, STEP and wiring documentation before final design or integration planning. |

[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-C30-S001-V009 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, wiring final integration, safety validation, enclosure certification or integration planning. during integration planning, verify all dimensions, mounting interfaces, coordinate definitions, load limits, cable and adapter configuration, power delivery, grounding, ingress conditions and environmental limits 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.

specified Resources