ENGINEERING DOCUMENTATION

Micro Servo Electric Cylinder

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-LA-C00-S009-V001	DRAFT-08 / 25 Aug 2026	Engineering Integration Reference

Integration Overview

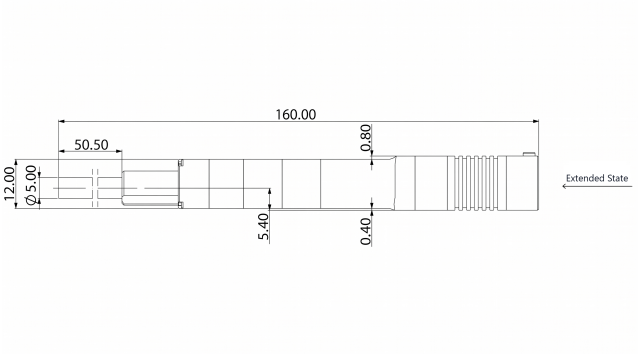
Compact electric actuator for robotic, medical and precision automation mechanisms. This guide supports mechanical-interface design, force and speed boundary , electrical and communication integration, cable routing, thermal and ingress and commissioning for ES-LA-C00-S009-V001.

Key Integration Facts

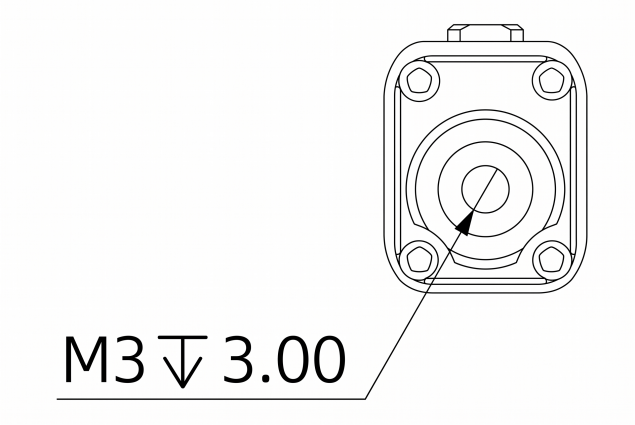
INTEGRATION ITEM	PUBLISHED VALUE
Maximum Push/Pull Force	50 N
Full-load Speed	8 mm/s
Stall Push/Pull Force	80 N
Maximum Self-locking Force	80 N
Electrical Interface	LVTTL serial interface
No-load Current	0.30 A
Mechanical Interface	Standard interface
Speed Grade	02

Product Structure & Views

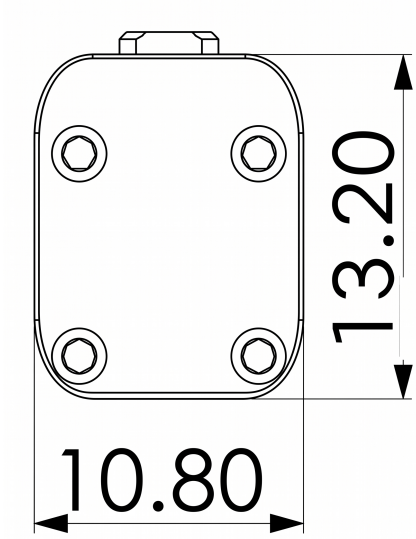
These views present the selected product structure, mounting interfaces and relevant integration geometry for this configuration.



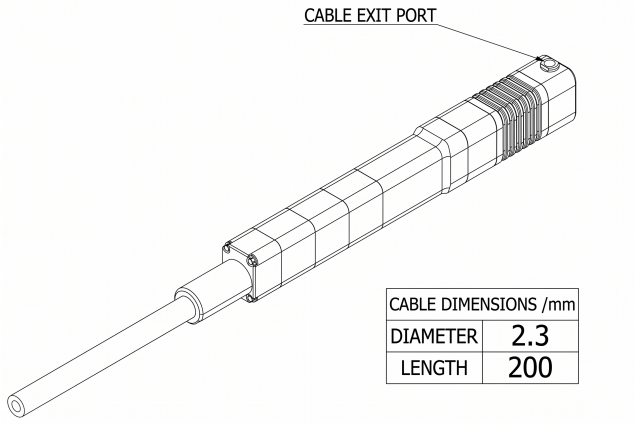
Mechanical View 1



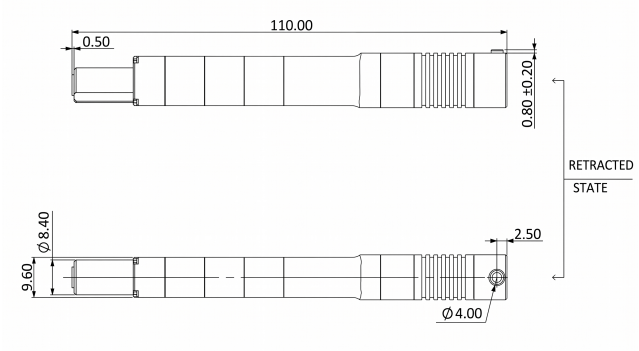
Mechanical View 2



Mechanical View 3



Mechanical View 4



Mechanical View 5

VIEW	FIELD	VALUE
Mechanical View 1	Extended-state overall length	160.00 mm
	Upper surface step offset	0.80 mm
	Rod extension length	50.50 mm
	State label	Extended state
	Rod diameter	Diameter 5.00 mm
	Left end outside height	12.00 mm
	Left lower step clearance	5.40 mm
	Middle lower step offset	0.40 mm
	Right lower step clearance	5.40 mm
Mechanical View 2	Ear interface vertical envelope dimension	13.20 mm
	Interface inner width	10.80 mm
	Interface mounting width	11.40 mm
	Ear interface overall width	16.40 mm
Mechanical View 3	Mounting hole thread and depth for ear interface	M3 thread, depth 3.00
Mechanical View 4	Retracted overall length	110.00 mm
	End shoulder offset length	0.50 mm
	End cap vertical offset tolerance	0.80 ± 0.20 mm
	Threaded hole specification and depth	M1.60 thread, depth 2.50 mm
	Side hole axial locating distance	5.00 mm
	View state label	Retracted position
	Upper side hole diameter	Diameter 4.00 mm
	Rod end diameter	Diameter 8.40 mm
	Boss axial locating distance	2.50 mm
	Rod end outer diameter or vertical size	9.60 mm
	Lower side hole diameter	Diameter 3.20 mm
	Bottom pin hole diameter with unilateral tolerances	Diameter 3 mm, upper deviation -0.01 mm, lower deviation -0.03 mm
Mechanical View 5	Cable dimensions table unit	Cable dimensions are specified in millimeters

Overall Dimensions and Mounting Interface

PARAMETER	PUBLISHED VALUE	UNIT
Mechanical Interface	Standard interface	

- Confirm the selected series configuration and exact SKU before using dimensions or interface geometry.
- Keep mounting faces flat, clean and free of burrs, raised holes, debris and coating buildup.
- Reserve assembly, cable, inspection and removal access around the actuator and linkage interface.

Mechanical Load Path and Joint Interface

PARAMETER	PUBLISHED VALUE	UNIT
Mechanical Interface	Standard interface	

- Route axial force through the specified joint interface, adapter and host structure; include offset, side load, acceleration, shock and emergency-stop cases.
- Validate axial, radial and moment loads with the linkage, guide and host stiffness; do not infer system capacity from the actuator envelope alone.
- Protect the joint interface from binding, impact, uncontrolled bending and misalignment throughout the stroke.

Power, Communication and Cable Integration

PARAMETER	PUBLISHED VALUE	UNIT
Electrical Interface	LVTTL serial interface	
No-load Current	0.30	A

- Use the published supply range and current boundary for this SKU, with suitable protection for normal, peak and fault conditions.
- Verify the selected communication interface, electrical levels, address or protocol settings and control-cycle compatibility before motion.
- Provide cable slack, bend radius and strain relief across the complete actuator and host motion envelope.
- Separate power, communication and low-level sensing paths according to the system EMC and grounding architecture.

Force, Position and Motion Validation

PARAMETER	PUBLISHED VALUE	UNIT
Maximum Push/Pull Force	50	N
Full-load Speed	8	mm/s
Stall Push/Pull Force	80	N
Maximum Self-locking Force	80	N
Speed Grade	02	

- Treat the published force-sensor detection range as a measurement boundary, not as complete actuator thrust or machine safety approval.
- Commission in stages with linkage, limits, guards and cable routing installed; verify each boundary before increasing speed or load.
- At low energy, verify position direction, command polarity, travel limits, communication status and force-signal mapping.

Thermal, Ingress and Maintenance Conditions

- Validate temperature using the installed voltage, peak current, load cycle, mounting heat path, ambient condition and enclosure.
- Treat IP40 as a product-boundary condition; validate connectors, cable entry, linkage and complete host protection separately.
- Prevent chips, fibers, cleaning residue and moisture from entering interfaces, cable exits and moving joints.
- Stop and inspect after binding, impact, abnormal noise, rising temperature, unexpected friction, communication loss or protection damage.

Commissioning and Safety

- Commission in stages with linkage, limits, guards and cable routing installed; verify each boundary before increasing speed or load.
- Before full-power operation, verify polarity, end limits, emergency stop, fault response and safe recovery behavior.
- Stop and inspect after binding, impact, abnormal noise, rising temperature, unexpected friction, communication loss or protection damage.

Integration Checklist

01	Confirm the drawing, published parameters and applicable wiring data identify this SKU.
02	Verify mechanical interface, joint bearing, adapter, orientation and service clearance.
03	Establish and validate the complete axial, side-load and moment load path.
04	Confirm supply range, peak current, communication interface, polarity and controller compatibility.
05	Provide cable slack, bend radius and strain relief across the full motion envelope.
06	Separate power, communication and low-level sensor paths according to the EMC architecture.
07	Treat force-sensor range as a measurement boundary and complete system-level load validation.
08	At low speed and low load verify position, direction, limits, communication and force-signal mapping.
09	Validate temperature, friction, noise, protection boundary and abnormal-stop behavior over the duty cycle.
10	Include specified 2D, STEP, wiring, commissioning and maintenance data in 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-LA-C00-S009-V001 and is intended for dimensional evaluation and preliminary integration. It is not a applicable manufacturing drawing, actuator selection approval, force or safety approval, wiring final integration, machinery risk assessment, safety validation or integration planning document and must not be used as the sole basis for machining, linkage design, fastener selection, cable assembly, drive configuration or final integration. Before design freeze, assembly or commissioning, verify dimensions, interface geometry, load path, power, communication, polarity, cable routing, force and speed boundaries, temperature, ingress, limits, thermal behavior, maintenance and fault handling 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 actuator, linkage, drive, host structure, motion cycle, guarding, fault cases and applicable regulatory requirements under intended operating conditions.