

ENGINEERING DOCUMENTATION

Adaptive Angular Electric Gripper

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-EG-C00-S009-V002	DRAFT-08 / 27 Aug 2026	Engineering Integration Reference

Integration Overview

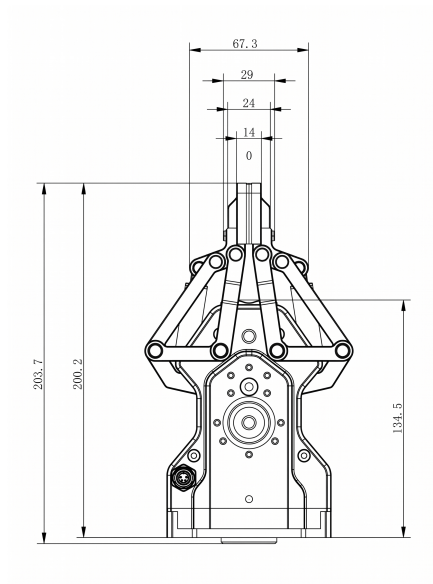
Adaptive angular electric end effector for adaptive gripping across a broad workpiece-size and shape envelope. This guide supports robot-flange integration, fingertip and workpiece design, load-path validation, cable and communication integration, commissioning and service planning for ES-EG-C00-S009-V002.

Key Integration Facts

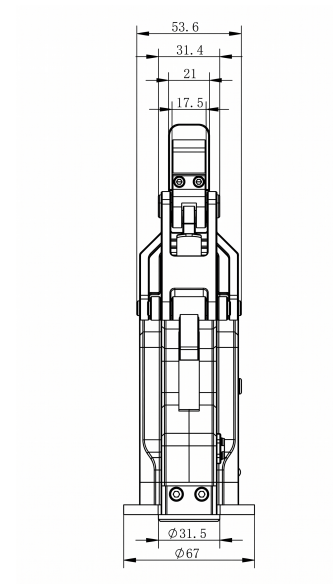
INTEGRATION ITEM	PUBLISHED VALUE
Total Stroke	95 mm
Maximum Recommended Payload	3 kg
Position Repeatability	± 0.03 mm
Full-Stroke Opening Time	0.9 s
Operating Voltage	24 V DC $\pm 10\%$ V DC
Product Mass	1 kg
Ingress Protection Rating	IP 54

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	Upper maximum width	67.3 mm
	Upper inner width	29 mm
	Upper intermediate width	24 mm
	Upper small width	14 mm
	Center zero offset callout	0 mm
	Left inner height	200.2 mm
	Left overall height	203.7 mm
	Right partial height	134.5 mm
Mechanical View 2	Upper maximum width	Width 53.6 mm
	Upper intermediate width	Width 31.4 mm
	Upper inner width	Width 21 mm
	Upper minimum inner width	Width 17.5 mm
	Bottom inner diameter or circular interface diameter	Diameter 31.5 mm
	Bottom outer diameter or outside envelope diameter	Diameter 67 mm

Overall Dimensions and Robot Flange Interface

PARAMETER	PUBLISHED VALUE	UNIT
Overall Dimensions	184.6 mm x 162.3 mm x 67	mm
Product Mass	1	kg

- Mount the gripper to the exact robot or adapter interface using the selected locating features; keep the mating face flat, clean and fully supported.
- Use the specified fastener pattern, grade, engagement and tightening sequence. Do not use the fasteners to pull a misaligned interface into position.
- Preserve access for cable replacement, fingertip service and fastener inspection without disassembling unrelated robot structures.

Fingertip, Workpiece and Gripping Envelope

PARAMETER	PUBLISHED VALUE	UNIT
Total Stroke	95	mm

- For adaptive gripping, validate the complete jaw path and contact sequence for the actual workpiece; irregular shapes can shift contact points and ejection direction.
- Minimize fingertip mass and overhang, preserve symmetry where applicable, and verify stiffness, fasteners, contact pressure, wear and collision clearance.
- Treat the full finger and linkage motion envelope as a pinch and collision zone; include workpiece uncertainty, cable motion and robot positioning tolerance.

Load, Moment and Payload Envelope

PARAMETER	PUBLISHED VALUE	UNIT
Maximum Recommended Payload	3	kg
Allowable Static Vertical Load Fz	300	N
Allowable Load Moment (Mx)	4.75	N·m
Allowable Load Moment (My)	4.75	N·m
Allowable Load Moment (Mz)	4.75	N·m

- Validate payload, gripping contact, vertical load and moment limits together with robot acceleration, emergency stop, workpiece center of mass and process disturbance.

Recommended Payload Conditions

ITEM	PUBLISHED / SOURCE CONDITION	INTEGRATION REQUIREMENT
Maximum recommended payload	3 kg	Do not treat this value as an unconditional lifting or retention limit.
Reference grip basis	Friction grip basis: coefficient 0.2 and safety factor 4	Recalculate for actual materials, surface condition, contact geometry and process risk.
Dynamic application	Not represented by the static reference mass alone	Include acceleration, emergency stop, robot orientation, vibration and impact.
Workpiece center of mass	Keep close to the gripping center where practical	Validate offset moments and retention throughout the complete robot trajectory.

Published Load and Moment Envelope

LOAD CASE	PUBLISHED LIMIT	INTEGRATION REQUIREMENT
Static vertical load Fz	300 N	Validate the complete flange, fingertips and workpiece load path against this exact-SKU limit.
Allowable moment Mx	4.75 Nm	Validate the complete flange, fingertips and workpiece load path against this exact-SKU limit.
Allowable moment My	4.75 Nm	Validate the complete flange, fingertips and workpiece load path against this exact-SKU limit.
Allowable moment Mz	4.75 Nm	Validate the complete flange, fingertips and workpiece load path against this exact-SKU limit.

Electrical, Cable and Communication Integration

PARAMETER	PUBLISHED VALUE	UNIT
Operating Voltage	24 V DC $\pm$ 10%	V DC
Continuous Rated Current	0.8	A
Peak Current	1.5	A
Continuous Rated Output Power	19.2	W
Communication Protocol	: Modbus RTU (RS485) Digital I/O(2 2) : TCP/IP USB2.0 CAN2.0A PROFINET EtherCAT*	

- De-energize the tool and verify the supply state before connecting or servicing power, I/O or communication wiring.
- Use the current harness and pin assignment for the exact SKU; do not infer functions from wire color, an older manual or another gripper family.
- Verify interface hardware, polarity, addressing, baud rate, termination and controller timing before enabling motion. Optional protocols require the corresponding selected interface configuration.
- Provide robot-rated cable routing, slack and strain relief through the complete wrist motion so cable loads do not bias the gripper or enter the finger envelope.

Commissioning and Control State

PARAMETER	PUBLISHED VALUE	UNIT
Position Repeatability	± 0.03	mm
Full-Stroke Opening Time	0.9	s
Full-Stroke Closing Time	0.9	s

- Initialize or recalibrate only with the complete finger motion envelope clear. After fingertip changes, perform the full calibration and save procedure before use.
- Coordinate I/O and serial control so one command authority governs motion at a time; prevent conflicting commands during startup, recovery and mode changes.
- Before normal operation, verify initialized, moving, position-reached, object-gripped and object-lost states against the host-machine logic.

Environmental, Ingress and Maintenance Conditions

PARAMETER	PUBLISHED VALUE	UNIT
Recommended Operating Environment	0~40°C, 85% RH	
Ingress Protection Rating	IP 54	
Operating Noise	< 60	dB
Transmission Mechanism	+	

- Apply the published ingress rating only to the selected component boundary. Cable interfaces, robot flange, custom fingertips and the complete end-effector require installation-specific validation.
- Keep finger interfaces and exposed motion areas clean, and periodically inspect fingertips, fasteners, cable, seals and housing for wear, looseness or damage.
- After replacing or modifying fingertips, verify mass, symmetry, fastener retention and collision clearance, then recalibrate before returning the tool to service.
- Remove the tool from service after abnormal impact, water ingress, cable damage, loss of repeatability or unexplained grip-state behavior until the cause is resolved.

Ingress Protection Boundaries

BOUNDARY	PUBLISHED CONDITION	INTEGRATION REQUIREMENT
Gripper body	IP 54	Applies only with the selected body, seals and interfaces intact under the stated test conditions.
Cable and mating connector	Not established by the body rating alone	Use a qualified mating connection and preserve sealing, strain relief and bend-radius requirements.
Robot flange and custom fingertips	Outside the component body rating	Custom interfaces must be sealed or protected as required by the application.
Completed end-effector	System rating requires validation	Validate the assembled tool under installation-specific water, dust, cleaning and motion exposure.

Integration Checklist

- 01 Confirm that the 2D drawing, published parameter set and applicable wiring data all identify ES-EG-C00-S009-V002.
- 02 Verify robot-flange geometry, locating features, fasteners, body envelope and cable exit against the 2D data.
- 03 Validate the adaptive jaw path, workpiece contact sequence and ejection direction.
- 04 Confirm custom fingertip mass, overhang, stiffness, retention, contact pressure and collision clearance.
- 05 Validate payload assumptions, workpiece center of mass, robot acceleration, emergency stop and allowable load moments.
- 06 Verify the supply, peak-current capacity, protective strategy, specified harness and interface polarity before power-up.
- 07 Confirm communication hardware, addressing, baud rate, termination and single-command-authority behavior.
- 08 Route and strain-relieve the cable through the complete wrist and gripper motion envelope.
- 09 Initialize with an unobstructed finger path and repeat full calibration after changing fingertips.
- 10 Verify position, gripping, object-loss and fault states before enabling automatic operation.
- 11 Validate ingress protection across the body, mating connector, robot flange, fingertips and complete end-effector.
- 12 Confirm cleaning, inspection and service-access provisions during integration planning.
- 13 Request current 2D, STEP, wiring, interface and commissioning 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-EG-C00-S009-V002 and is intended for dimensional evaluation and preliminary integration. It is not a applicable manufacturing drawing, fingertip design approval, wiring diagram, communication manual, machinery risk assessment or safety validation and must not be used as the sole basis for machining, tooling, conductor selection, protective-device selection or integration planning. Before design freeze or energization, verify all dimensions, robot-flange and fingertip interfaces, fasteners, motion and pinch envelopes, payload assumptions, static and dynamic loads, allowable moments, workpiece contact conditions, cable routing, supply and interface limits, communication configuration, initialization behavior, control-state handling, ingress boundaries, maintenance requirements 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 end-effector and machine under intended workpieces, accelerations, fault cases, environment, guarding and applicable regulatory requirements.