ENGINEERING DOCUMENTATION

Ultra-Short Gear Unit

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-HG-S29-F8-R100	DRAFT-08 / 28 Aug 2026	Engineering Integration Reference

Integration Overview

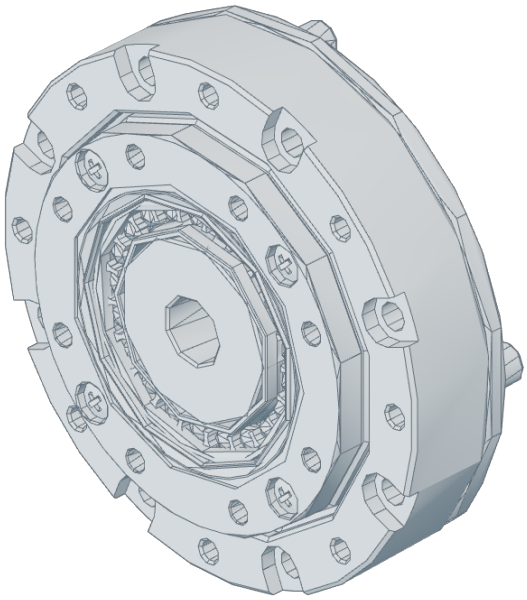
Ultra-Short Gear Unit for compact, coaxial, high-ratio rotary-axis integration. This guide supports interface planning, mounting alignment, duty validation, torsional behavior, lubrication, sealing and commissioning for ES-HG-S29-F8-R100.

Key Integration Facts

INTEGRATION ITEM	VALUE
Rated Torque	1.65 N·m
Instantaneous Maximum Torque	6.3 N·m
Start/Stop Peak Torque	3.3 N·m
Reduction Ratio	100
Maximum Input Speed	Configuration-dependent (2 records)
Frame Size	8
Weight	0.06 kg

3D Orientation Reference

This axonometric reference provides a quick orientation check for the reducer body, input interface and mounting relationship of ES-HG-S29-F8-R100.



Axonometric Orientation View

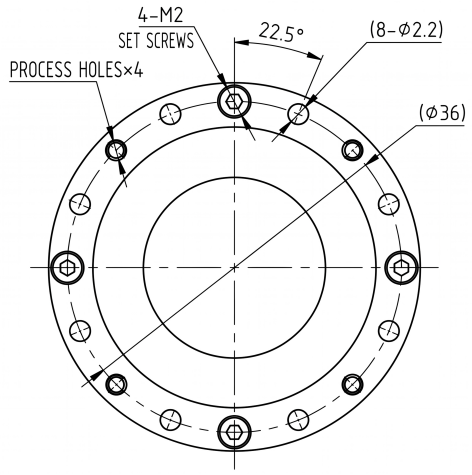
Orientation reference only. Use the exact-SKU parameter table and mechanical drawing for dimensions, hole geometry, fits and machining decisions.

Exact-SKU Interface Cross-Reference

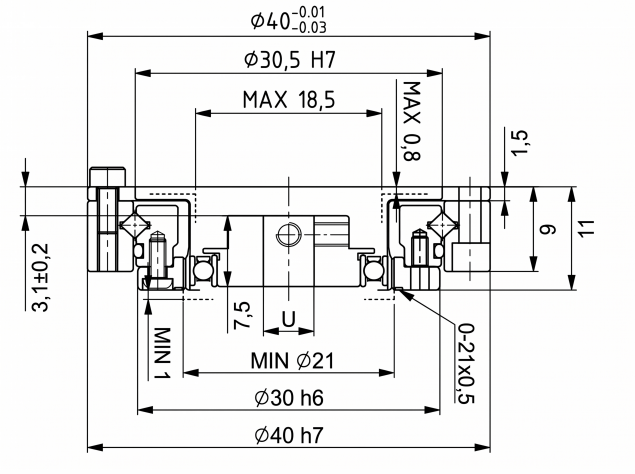
INTEGRATION TOPIC	EXACT-SKU REFERENCE
Reducer envelope and configuration	Frame Size: 8; Reduction Ratio: 100; Weight: 0.06 kg. Confirm hole geometry, datum features and fits in the exact-SKU mechanical drawing.
Torque and speed boundaries	Rated Torque: 1.65 N·m; Start/Stop Peak Torque: 3.3 N·m; Instantaneous Maximum Torque: 6.3 N·m; Maximum Input Speed: Configuration-dependent (2 records). Confirm hole geometry, datum features and fits in the exact-SKU mechanical drawing.
Input and mounting interfaces	Confirm this interface from the exact-SKU mechanical drawing.

Product Structure & Views

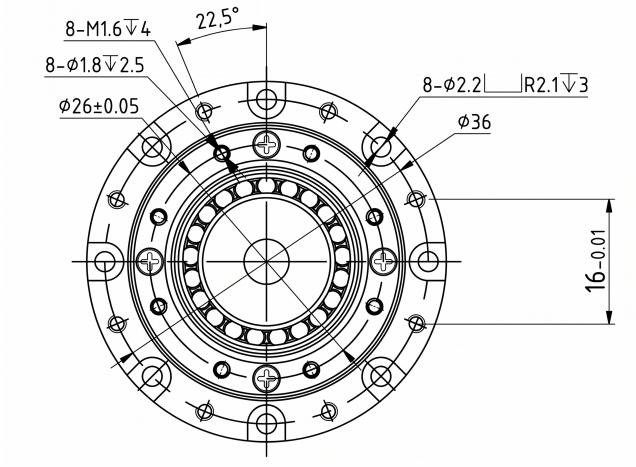
These views present the selected product structure, mounting interfaces and relevant integration geometry for this SKU.



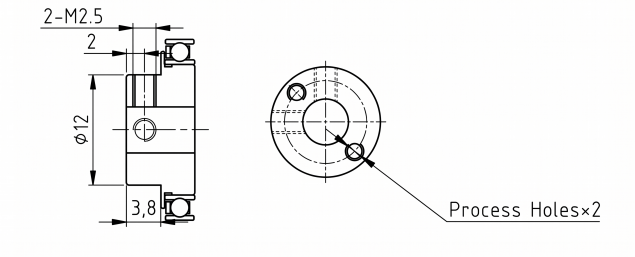
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

VIEW	FIELD	VALUE
Mechanical View 1	Set Screws	4×M2 set screws
	Hole Angular Spacing	22.5°
	Through Hole Diameter	8×⌀2.2 holes
	Process Holes	4×process holes
	Outer Circle Diameter	⌀36

VIEW	FIELD	VALUE
Mechanical View 2	Outer diameter (upper shoulder)	Ø40 -0.01/-0.03
	Mounting hole diameter	Ø30.5 H7
	Internal cavity maximum width	MAX 18.5
	Maximum radial offset	MAX 0.8
	Edge distance	1.5
	Height dimension 1	9
	Height dimension 2	11
	Left edge distance	3.1±0.2
	Minimum chamfer/radius	MIN 1
	Horizontal distance/keyway width	7.5
	Datum reference	U
	Minimum hole diameter	MIN Ø21
	Thread or groove feature	0-21×0.5
	Shaft diameter (lower shoulder)	Ø30 h6
	Shaft diameter (outermost)	Ø40 h7
Mechanical View 3	Threaded mounting holes quantity and specification	8× M1.6 threaded holes, depth 4 mm
	Through holes quantity and diameter	8× Ø1.8 mm through holes, depth 2.5 mm
	Mounting holes bolt circle diameter	Ø26±0.05 mm
	Angular spacing of mounting holes	22.5°
	Additional holes quantity and diameter	8× Ø2.2 mm holes
	Chamfer radius	R2.1 mm, depth 3 mm
	Outer diameter	Ø36 mm
	Circular runout tolerance	Circular runout 0.01 mm relative to datum A
	Datum A	Datum A
Mechanical View 4	Mounting threaded hole specification	2× M2.5 threaded holes
	Mounting hole depth or position dimension	2 mm
	Process hole diameter	Ø2 mm
	Process hole position dimension	3.8 mm
	Process hole quantity	2× process holes

Overall Dimensions and Input Interface

PARAMETER	VALUE	UNIT
Frame Size	8	
Reduction Ratio	100	
Weight	0.06	kg

Input Interface Design Guidance

- Confirm the selected series, frame size, ratio and product form before using dimensions or interface geometry.
- Design the input shaft, key, engagement and axial retention for the verified torque and assembly state.
- Reserve assembly, sealing, inspection and removal access around input, housing and output interfaces.

Mounting, Alignment and Fastener Control

- Keep mounting faces flat, clean and free of burrs, debris and coating buildup.
- Control concentricity, tilt and axial position of input and housing datums.
- Tighten fasteners in a staged diagonal sequence and verify free, even rotation during assembly.

Torque, Speed and Duty Boundaries

PARAMETER	VALUE	UNIT
Rated Torque	1.65	N·m
Allowable Average Torque	2.3	
Start/Stop Peak Torque	3.3	
Instantaneous Maximum Torque	6.3	
Maximum Input Speed		

CONDITION	VALUE	UNIT
frame_size: 8; reduction_ratio: 100; size: 8	8500	r/min
frame_size: 8; reduction_ratio: 100	8000	

Average Input Speed	3500	r/min
Design Life	8000	h

- Calculate torque and speed from acceleration, constant-speed, deceleration, dwell and reversal portions of the complete cycle.
- Treat start/stop peak and instantaneous maximum torque as transient boundaries.
- Validate life against actual torque, speed, shock frequency, lubrication, temperature, alignment and external loading.

Torque, Speed and Life Boundaries

PARAMETER	VALUE	INTEGRATION REQUIREMENT
Rated Torque	1.65 N·m	Use as the selected continuous output rating under validated duty and thermal conditions.
Allowable Average Torque	2.3 N·m	Calculate the actual time-weighted output torque over the complete cycle.
Start/Stop Peak Torque	3.3 N·m	Transient start/stop boundary; include acceleration and deceleration events.
Instantaneous Maximum Torque	6.3 N·m	Short-duration shock boundary only; do not use as a normal operating point.
Maximum Input Speed	Configuration-dependent (2 records)	Maximum input-speed boundary; also verify motor and thermal limits.
Average Input Speed	3500 r/min	Validate the time-weighted average input speed over the complete duty cycle.
Design Life	8000 h	Design reference only; actual life depends on torque, speed, shock, lubrication and installation.

Transmission Accuracy and Torsional Rigidity

PARAMETER	VALUE	UNIT
Angle Transmission Accuracy	2	arc min
Hysteresis Loss	3	

- Installed positioning depends on reducer behavior, datum control, structural stiffness, motor and encoder errors and thermal growth.
- Use stiffness regions and transition torques when evaluating compliance, resonance, control gain and reversal.

Lubrication, Sealing and Thermal Control

- Use the specified lubricant, fill method and quantity for the exact configuration; do not mix incompatible lubricants.
- Provide compatible sealing at input, output and housing interfaces without distorting the reducer.
- Validate lubricant distribution and temperature for orientation, speed, load cycle and enclosure.
- Prevent chips, fibers, residue and moisture from entering gear or bearing cavities.

Output Bearing and External Load Path

- Calculate radial, axial and moment loads including offset, acceleration, gravity, process force, impact and emergency stops.
- Do not infer permissible external load from reducer torque capacity or frame size.
- Avoid forcing, impact, misalignment or host distortion through the output support during installation and operation.

Integration Checklist

01	Confirm the selected series, frame size, ratio and product form for this SKU.
02	Verify available dimensions and interface geometry without substituting a nearby configuration.
03	Check mounting-face flatness, concentricity, tilt, reliefs, cleanliness and support stiffness.
04	Verify input shaft, key, engagement length and axial retention.
05	Use staged diagonal tightening and verify free, even rotation.
06	Calculate average, start/stop peak and shock torque over the complete cycle.
07	Validate average and maximum input speed, design life and thermal condition.
08	Evaluate backlash, angular accuracy, hysteresis and stiffness for the control system.
09	Confirm lubricant, fill quantity, orientation, sealing and contamination controls.
10	Validate output radial, axial and moment loads using applicable bearing data.

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-HG-S29-F8-R100 and supports preliminary dimensional evaluation and integration. It is not a manufacturing drawing, reducer selection approval, bearing-load approval, lubrication specification, machinery risk assessment, safety validation or integration planning document. Before design freeze, assembly or commissioning, verify all dimensions, datum geometry, fits, interfaces, retention, fasteners, torque and speed duty, shock cases, torsional behavior, external loads, lubrication, sealing, temperature, contamination and maintenance requirements against the current EmbodyStack engineering data for this exact SKU. Validate the complete reducer, motor, host structure, output load, motion cycle, guarding, fault cases and applicable regulatory requirements under intended operating conditions.