

ENGINEERING DOCUMENTATION

Special Standard Cup Unit

Dimensional & Integration Guide

DOCUMENT	REVISION / ISSUE	STATUS
DIG-ES-HG-S21-F25-R30	DRAFT-08 / 28 Aug 2026	Engineering Integration Reference

Integration Overview

Special Standard Cup 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-S21-F25-R30.

Key Integration Facts

INTEGRATION ITEM	VALUE
Reduction Ratio	30
Frame Size	25

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



VIEW	FIELD	VALUE
Mechanical View 1	Overall length	49 mm
	Main body length	46 mm
	O-ring specification	O-ring 0-80x2
	Mounting groove width	5.5 mm
	Mounting groove depth	10 mm
	Left flange height	4.5 mm
	Center boss width	14 mm
	Left flange thickness	0.5 mm
	Center boss depth	12 mm
	Datum T	Datum T
	Right side outer diameter	Ø7 mm
	Left output shaft outer diameter with tolerance	Ø6 h7
	Left shaft section diameter	Ø5 mm
	Center bore diameter	Ø8 mm
	Right output shaft outer diameter with tolerance	Ø7 h7
	Center bore section diameter	Ø5 mm
	Right through hole diameter	Ø0 mm
	Center bore section diameter with tolerance	Ø0 H7
	Datum D (right)	Datum D
	Right shaft section length with negative deviation	14.5 -0.1 mm
	O-ring specification	O-ring 0-53x1
	Bottom boss width	29 mm
	Bottom dimension with bilateral deviation	13.5±0.2 mm
	Bottom boss height	3.5 mm
	Local axial dimension	Local axial dimension 4.4 mm
Mechanical View 2	Eight mounting holes diameter 5.5	8 holes, diameter 5.5
	Width symbol W	Symbolic width W; numeric value not specified in this crop
	Eight M5 threaded holes	8 × M5 threaded holes
	Process holes quantity	4 process holes
	Outer diameter 96	Diameter 96
	Symbol U	Symbol U; associated numeric value not specified in this crop
	Diameter 32 interface	Diameter 32
	Four M5 threaded holes	4 × M5 threaded holes
Mechanical View 3	Quantity and specification of M8 threaded holes	8 × M8 threaded holes
	Diameter 42 circular feature	Diameter 42 mm
Mechanical View 4	View direction	View D
	Inner bore diameter	Diameter 18 mm
	Outer circular feature or hole diameter	Diameter 22 mm
	Threaded hole quantity and thread size	2 × M2.5 threaded holes
	Hole depth or countersink depth	Depth 5 mm

Housing and Input Interface Dimensions

Housing Size: 25 Reduction Ratio: 30

WAVE GENERATOR	T (MM)	U	W
A11	12.8 +0.10	11 H7	4 JS9/P9
A14	16.3 +0.10	14 H7	5 JS9/P9

Note: Dimensions in mm unless otherwise specified. Refer to the dimensional drawing for feature locations and datum definitions.

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

- 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.

Transmission Accuracy and Torsional Rigidity

- 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-S21-F25-R30 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.