

## ENGINEERING DOCUMENTATION

# Standard Cup Unit Type I

## Dimensional &amp; Integration Guide

| DOCUMENT              | REVISION / ISSUE       | STATUS                            |
|-----------------------|------------------------|-----------------------------------|
| DIG-ES-HG-S22-F25-R30 | DRAFT-08 / 28 Aug 2026 | Engineering Integration Reference |

## Integration Overview

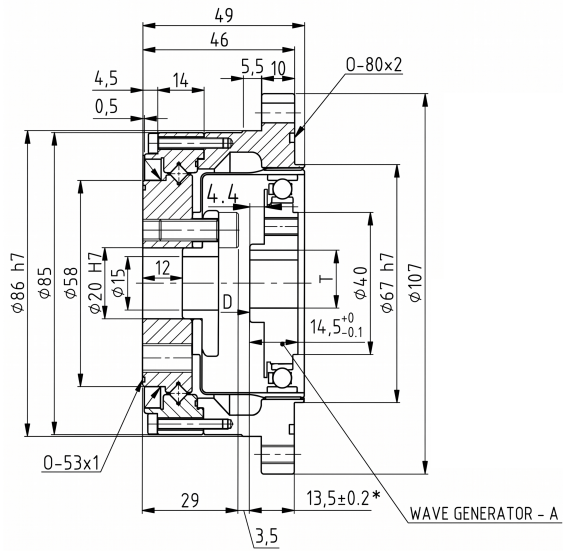
Standard Cup Unit Type I for compact, coaxial, high-ratio rotary-axis integration. This guide supports interface planning, mounting alignment, duty validation, torsional behavior, lubrication, sealing and commissioning for ES-HG-S22-F25-R30.

## Key Integration Facts

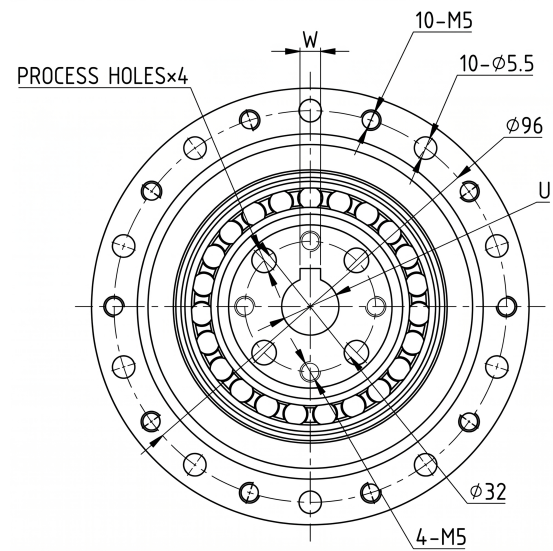
| INTEGRATION ITEM | VALUE |
|------------------|-------|
| Reduction Ratio  | 30    |
| Frame Size       | 25    |

## Product Structure & Views

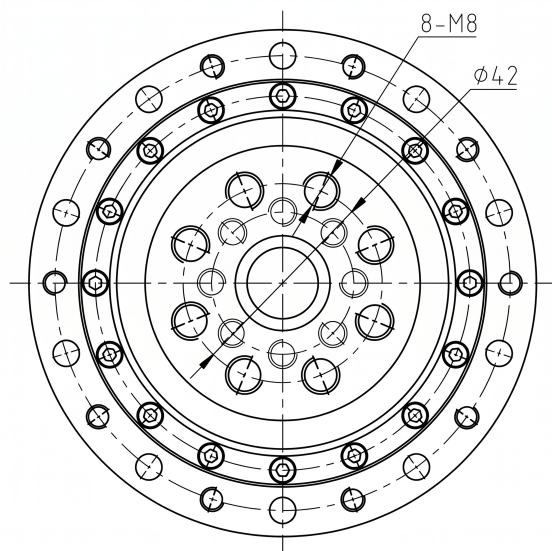
These views present the selected product structure, mounting interfaces and relevant integration geometry for this SKU.



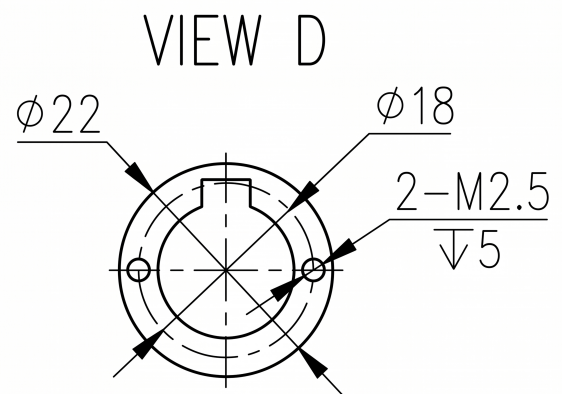
Mechanical View 1



### Mechanical View 2



### Mechanical View 3



### Mechanical View 4



| VIEW              | FIELD                                           | VALUE                                                           |
|-------------------|-------------------------------------------------|-----------------------------------------------------------------|
| Mechanical View 1 | Overall axial length                            | 49 mm                                                           |
|                   | Axial length 2                                  | 46 mm                                                           |
|                   | Thread or tooth profile specification           | 0-80x2                                                          |
|                   | Axial segment length 5.5                        | 5.5 mm                                                          |
|                   | Axial segment length 10                         | 10 mm                                                           |
|                   | Axial segment length 4.5                        | 4.5 mm                                                          |
|                   | Axial segment length 14                         | 14 mm                                                           |
|                   | Axial segment length 0.5                        | 0.5 mm                                                          |
|                   | Outer diameter $\varnothing 6$ h7               | $\varnothing 6$ h7                                              |
|                   | Outer diameter $\varnothing 5$                  | $\varnothing 5$ mm                                              |
|                   | Outer diameter $\varnothing 8$                  | $\varnothing 8$ mm                                              |
|                   | Bore diameter $\varnothing 0$ H7                | $\varnothing 0$ H7                                              |
|                   | Bore diameter $\varnothing 5$                   | $\varnothing 5$ mm                                              |
|                   | Axial segment length 12                         | 12 mm                                                           |
|                   | Groove depth or step 4.4                        | 4.4 mm                                                          |
|                   | Datum D (left view)                             | Datum D                                                         |
|                   | Label T                                         | T                                                               |
|                   | Outer diameter $\varnothing 0$                  | $\varnothing 0$ mm                                              |
|                   | Outer diameter $\varnothing 7$ h7               | $\varnothing 7$ h7                                              |
|                   | Maximum outer diameter $\varnothing 07$         | $\varnothing 07$ mm                                             |
|                   | Axial dimension 14.5 +0/-0.1                    | 14.5 +0/-0.1 mm                                                 |
|                   | Datum D (right view)                            | Datum D                                                         |
|                   | Thread or spline specification 0-53x1           | 0-53x1                                                          |
|                   | Axial length 29                                 | 29 mm                                                           |
|                   | Axial dimension 13.5±0.2 (reference/special)    | 13.5 ±0.2 mm *                                                  |
|                   | Axial segment length 3.5                        | 3.5 mm                                                          |
|                   | Component label - Wave Generator A              | Wave Generator - A                                              |
| Mechanical View 2 | M5 threaded hole quantity                       | 10 × M5 threaded holes                                          |
|                   | Local width label                               | Width identified as W; numeric value not specified in this crop |
|                   | 5.5 mm mounting hole quantity                   | 10 × $\varnothing 5.5$ holes                                    |
|                   | Process hole quantity note                      | Process holes ×4                                                |
|                   | Diameter 96 circular feature                    | $\varnothing 6$                                                 |
|                   | U label                                         | U label; numeric value not specified                            |
|                   | Diameter 32 circular feature                    | $\varnothing 2$                                                 |
|                   | M5 threaded hole quantity                       | 4 × M5 threaded holes                                           |
| Mechanical View 3 | Threaded mounting hole quantity and thread size | 8 × M8 threaded holes                                           |
|                   | Mounting hole pitch circle diameter             | Diameter 42                                                     |
| Mechanical View 4 | View identification                             | View D                                                          |
|                   | Outer diameter dimension                        | Diameter 22 mm                                                  |
|                   | Inner diameter dimension                        | Diameter 18 mm                                                  |

| VIEW                                   | FIELD                   | VALUE |
|----------------------------------------|-------------------------|-------|
| Threaded hole quantity and thread size | 2 × M2.5 threaded holes |       |
| Hole 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.

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## 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.

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## 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.

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## 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.                   |

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[View SKU Product Datasheet](#)   [Request controlled 2D drawing](#)   [Request controlled STEP review](#)   [Request a Quote](#)

### Engineering Use and Verification Notice

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**01.** This Dimensional & Integration Guide applies only to EmbodyStack SKU ES-HG-S22-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.