

## ENGINEERING DOCUMENTATION

# Standard Cup Unit Type I

## Dimensional &amp; Integration Guide

| DOCUMENT              | REVISION / ISSUE       | STATUS                            |
|-----------------------|------------------------|-----------------------------------|
| DIG-ES-HG-S22-F14-R30 | DRAFT-08 / 28 Aug 2026 | Engineering Integration Reference |

## Integration Overview

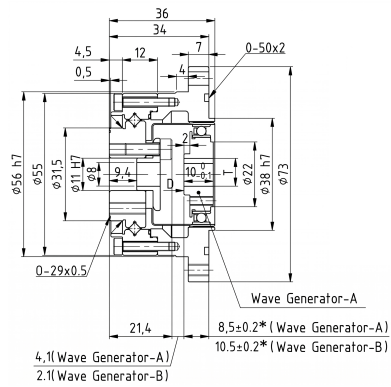
Standard Cup Unit Type I for compact, coaxial, high-ratio rotary-axis integration. This guide supports interface planning, mounting alignment, duty validation, torsional behavior, lubrication, sealing and commissioning for ES-HG-S22-F14-R30.

## Key Integration Facts

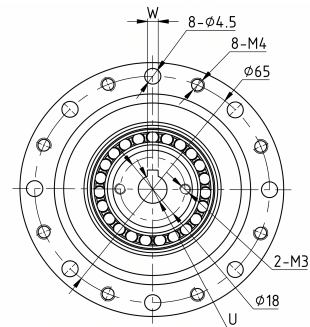
| INTEGRATION ITEM | VALUE |
|------------------|-------|
| Reduction Ratio  | 30    |
| Frame Size       | 14    |

## Product Structure & Views

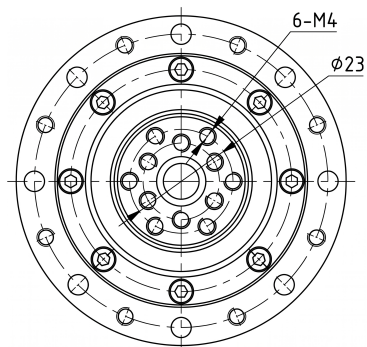
These views present the selected product structure, mounting interfaces and relevant integration geometry for this SKU.



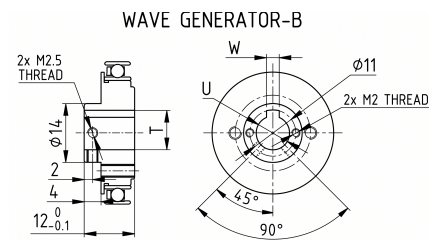
Mechanical View 1



### Mechanical View 2

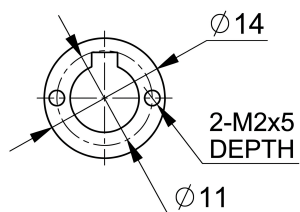


Mechanical View 3



### Mechanical View 4

## VIEW D



### Mechanical View 5



| VIEW              | FIELD                                            | VALUE                             |
|-------------------|--------------------------------------------------|-----------------------------------|
| Mechanical View 1 | Upper overall length                             | 36                                |
|                   | Upper inner length                               | 34                                |
|                   | Local axial distance                             | 7                                 |
|                   | Chamfer or relief callout                        | 0-50x2                            |
|                   | Local axial distance                             | 4.5                               |
|                   | Local axial distance                             | 12                                |
|                   | Local clearance or step width                    | 0.5                               |
|                   | Right-side fit diameter                          | Diameter 38 h7                    |
|                   | Left-side fit diameter                           | Diameter 56 h7                    |
|                   | Left-side diameter                               | Diameter 55                       |
|                   | Right-side outside diameter                      | Diameter 73                       |
|                   | Left-side inner diameter                         | Diameter 31.5                     |
|                   | Right-side shaft diameter                        | Diameter 22                       |
|                   | Hole diameter with H7 tolerance                  | Diameter 11 H7                    |
|                   | Hole diameter                                    | Diameter 8                        |
|                   | Tatum T                                          | Tatum T                           |
|                   | Chamfer or relief callout                        | 0-29x0.5                          |
|                   | Wave Generator A label                           | Wave Generator-A                  |
|                   | Wave Generator A associated dimension            | 8.5 +/- 0.2 for Wave Generator-A  |
|                   | Bottom local length                              | 21.4                              |
|                   | Wave Generator B associated dimension            | 10.5 +/- 0.2 for Wave Generator-B |
|                   | Left-Side Axial Length                           | 9.4 mm                            |
|                   | Middle Axial Face Distance                       | 2 mm                              |
|                   | Upper Step Axial Width                           | 4 mm                              |
|                   | Center section height tolerance                  | 10 0/-0.1                         |
|                   | Datum identifier D                               | Datum D                           |
|                   | Wave Generator-B related dimension               | 2.1 mm (WAVE GENERATOR-B)         |
|                   | Right section inner width                        | 2 mm                              |
| Mechanical View 2 | Local width designation                          | W                                 |
|                   | Through hole quantity and diameter               | 8 holes, diameter 4.5             |
|                   | Threaded mounting hole quantity and thread size  | 8 threaded holes, M4              |
|                   | Outer diameter                                   | Diameter 65                       |
|                   | Threaded hole quantity and thread size           | 2 threaded holes, M3              |
|                   | Hole diameter                                    | Diameter 18                       |
|                   | Datum or orientation label U                     | U                                 |
| Mechanical View 3 | Threaded mounting holes quantity and thread size | 6 threaded holes, M4              |
|                   | Diameter of circular feature                     | Diameter 23 mm                    |

| VIEW              | FIELD                                | VALUE                                                      |
|-------------------|--------------------------------------|------------------------------------------------------------|
| Mechanical View 4 | Drawing title                        | Wave Generator-B                                           |
|                   | Width parameter W                    | W dimension label; numeric value not specified in OCR crop |
|                   | Left-side mounting threaded holes    | 2 × M2.5 threaded holes                                    |
|                   | Diameter 11 hole or circular feature | Diameter 11                                                |
|                   | U datum or feature label             | U label                                                    |
|                   | Right-side mounting threaded holes   | 2 × M2 threaded holes                                      |
|                   | Diameter 14 hole or circular feature | Diameter 14                                                |
|                   | Linear dimension 2                   | 2                                                          |
|                   | Linear dimension 4                   | 4                                                          |
|                   | Angular position                     | 45 degrees                                                 |
|                   | Linear dimension 12 with tolerance   | 12 +0/-0.1                                                 |
|                   | Hole angular spacing                 | 90°                                                        |
|                   | Parameter T                          | T, value not specified                                     |
| Mechanical View 5 | View identifier                      | View D                                                     |
|                   | Diameter 14 feature                  | Diameter 14 mm                                             |
|                   | Two M2 threaded holes depth          | 2x M2 threaded holes, depth 5 mm                           |
|                   | Diameter 11 feature                  | Diameter 11 mm                                             |

## Housing and Input Interface Dimensions

Housing Size: 14 Reduction Ratio: 30

| WAVE GENERATOR | T (MM)     | U     | W        |
|----------------|------------|-------|----------|
| A8             | 9.4 +0.10  | 8 H7  | 3 JS9/P9 |
| 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.

## 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-S22-F14-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.