PRODUCT DATASHEET

ES-HG-S07-F20-R120

Precision Transmission Component

Hat Harmonic Gearboxes | High-Torque Hat Unit Type I

Product Overview

Precision Transmission Component with rated Torque 52 N·m, instantaneous Maximum Torque 191 N·m and start/Stop Peak Torque 113 N·m.

Key Specifications

PARAMETER	VALUE	UNIT
Rated Torque	52	N·m
Instantaneous Maximum Torque	191	N·m
Start/Stop Peak Torque	113	N·m
Reduction Ratio	120	
Maximum Input Speed	6500	r/min
Allowable Average Torque	64	N·m
Frame Size	20	
Weight	0.72	kg
Average Input Speed	3500	r/min

Technical Specifications

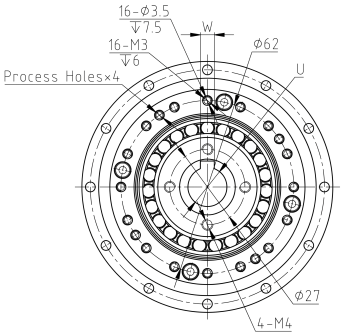
PARAMETER	SPECIFICATION	UNIT	NOTES
PERFORMANCE			
Rated Torque	52	N·m	Frame Size: 20; Reduction Ratio: 120; Size: 20
Instantaneous Maximum Torque	191	N·m	Frame Size: 20; Reduction Ratio: 120; Size: 20
Start/Stop Peak Torque	113	N·m	Frame Size: 20; Reduction Ratio: 120; Size: 20
Allowable Average Torque	64	N·m	Frame Size: 20; Reduction Ratio: 120; Size: 20
Starting Torque	4.2	N·m	Frame Size: 20; Reduction Ratio: 120; Size: 20
Angle Transmission Accuracy	1	arcmin	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Hysteresis Loss	1	arcmin	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
MECHANICAL			
Frame Size	20		Frame Size: 20; Reduction Ratio: 120; Size: 20
Weight	0.72	kg	Frame Size: 20; Reduction Ratio: 120
Wave Generator Dimension T	9.4+0.10 / 16.3+0.10 / 12.8+0.10	mm	Varies by published configuration.
Wave Generator Bore U	φ8H7 / φ14H7 / φ11H7		Varies by published configuration.
Wave Generator Keyway W	4JS9/P9 / 3JS9/P9 / 5JS9/P9		Varies by published configuration.
RELIABILITY			
Design Life	15000	h	Frame Size: 20; Reduction Ratio: 120; Size: 20
ADDITIONAL SPECIFICATIONS			
Reduction Ratio	120		Frame Size: 20; Reduction Ratio: 120; Size: 20
Maximum Input Speed	6500	r/min	Frame Size: 20; Reduction Ratio: 120; Size: 20
Average Input Speed	3500	r/min	Frame Size: 20; Reduction Ratio: 120; Size: 20
Torsional Rigidity K2	2.5	×10⁴ N·m/rad	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity K1	1.6	×10⁴ N·m/rad	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity K3	2.9	×10⁴ N·m/rad	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity T2	25	N·m	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity T1	7	N·m	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20

Dimensional & Integration Overview

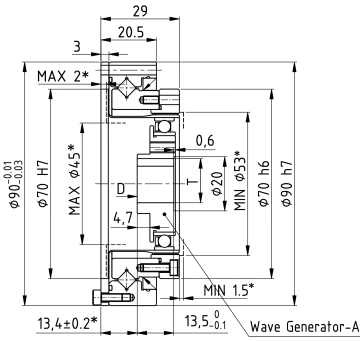
Mechanical Overview

PARAMETER	VALUE	UNIT
Frame Size	20	
Weight	0.72	kg
Wave Generator Dimension T	9.4+0.10 / 16.3+0.10 / 12.8+0.10	mm
Wave Generator Bore U	φ8H7 / φ14H7 / φ11H7	
Wave Generator Keyway W	4JS9/P9 / 3JS9/P9 / 5JS9/P9	

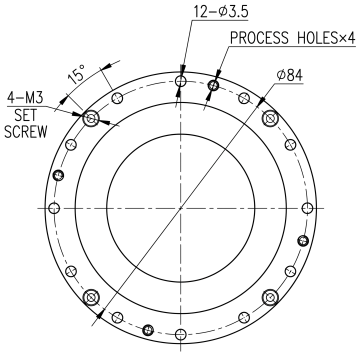
Dimensional Drawings



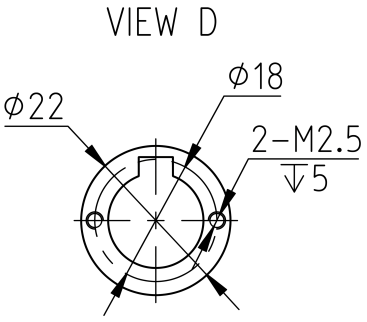
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 1	Sixteen diameter 3.5 holes	16 holes, diameter 3.5 mm
	Depth for diameter 3.5 holes	Depth 7.5 mm
	Width W	Width W, value not specified in this crop
	Diameter 62	Diameter 62 mm
	Sixteen M3 threaded holes	16 M3 threaded holes
	Depth for M3 threaded holes	Depth 6 mm
	Variable U	U, value not specified in this crop
	Process holes quantity four	Process holes ×4
	Diameter 27	Diameter 27 mm
	M4 threaded holes	M4 threaded holes; quantity not reliably OCR-confirmed

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 2	Overall Length	29 mm
	Internal Section Length	20.5 mm
	Mounting Boss Depth	3 mm
	Maximum Radial Deviation	MAX 2 mm (reference)
	Clearance or Feature Height	0.6 mm
	Maximum Outer Diameter	MAX Φ45 mm (reference)
	Minimum Inner Diameter	MIN Φ53 mm (reference)
	Mounting Flange Outer Diameter	Φ90 -0.01/-0.03 mm
	Mounting Bore Diameter	Φ70 H7
	Shaft Diameter	Φ20 mm
	Wave Generator Shaft Diameter	Φ90 h7
	Feature Dimension or Clearance	4.7 mm
	Minimum Clearance	MIN 1.5 mm (reference)
	Mounting Height	13.5 0/-0.1 mm
	Mounting Reference Height	13.4±0.2 mm (reference)
	Datum Reference	Datum D

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 3	12 holes diameter 3.5	12 holes, diameter 3.5 mm
	Process holes quantity	Process holes, quantity 4
	Diameter 84 circle	Diameter 84 mm
	4 M3 set screws	4 × M3 set screw
Mechanical View 4	Detail view identifier	View D
	Inner hole diameter	Diameter 18 mm
	Outer circular feature diameter	Diameter 22 mm
	Threaded hole quantity and size	2 holes, M2.5 thread
	Depth callout	Depth 5 mm

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01 Specifications are subject to change without notice. Verify the current product configuration before final design release.

02 2D drawings, CAD files and integration documentation are controlled documents and are supplied separately on request.