PRODUCT DATASHEET

ES-HG-S07-F50-R80

Precision Transmission Component

Hat Harmonic Gearboxes | High-Torque Hat Unit Type I

Product Overview

Precision Transmission Component with rated Torque 484 N·m, instantaneous Maximum Torque 2418 N·m and start/Stop Peak Torque 1223 N·m.

Key Specifications

PARAMETER	VALUE	UNIT
Rated Torque	484	N·m
Instantaneous Maximum Torque	2418	N·m
Start/Stop Peak Torque	1223	N·m
Reduction Ratio	80	
Maximum Input Speed	3500	r/min
Allowable Average Torque	675	N·m
Backlash	≤20	arc sec
Frame Size	50	
Weight	9.6	kg

Technical Specifications

PARAMETER	SPECIFICATION	UNIT	NOTES
PERFORMANCE			
Rated Torque	484	N·m	Frame Size: 50; Reduction Ratio: 80; Size: 50
Instantaneous Maximum Torque	2418	N·m	Frame Size: 50; Reduction Ratio: 80; Size: 50
Start/Stop Peak Torque	1223	N·m	Frame Size: 50; Reduction Ratio: 80; Size: 50
Backlash	≤20	arc sec	Reduction Ratio: 80; Size: 50; Frame Size: 50
Allowable Average Torque	675	N·m	Frame Size: 50; Reduction Ratio: 80; Size: 50
Starting Torque	73 / 0.73	N·m	Frame Size: 50; Reduction Ratio: 80; Size: 50 / Reduction Ratio: 80; Size: 50; Frame Size: 50
Angular Transmission Accuracy	1	arcmin	Frame Size: 50; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 50
Hysteresis Loss	1	arcmin	Frame Size: 50; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 50
MECHANICAL			
Frame Size	50		Frame Size: 50; Reduction Ratio: 80; Size: 50
Weight	9.6	kg	Frame Size: 50; Reduction Ratio: 80; Size: 50
Wave Generator Dimension T	24.8+0.10 / 21.8+0.10 / 25.3+0.10	mm	Varies by published configuration.
Wave Generator Bore U	φ22H7 / φ19H7		Varies by published configuration.
Wave Generator Keyway W	8JS9/P9 / 6JS9/P9		Varies by published configuration.

Technical Specifications

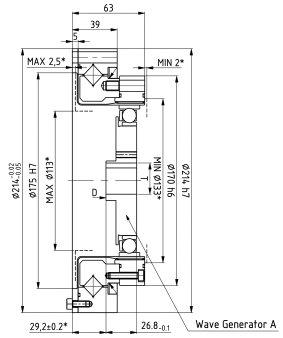
PARAMETER	SPECIFICATION	UNIT	NOTES
RELIABILITY			
Design Life	15000	h	Frame Size: 50; Reduction Ratio: 80; Size: 50
ADDITIONAL SPECIFICATIONS			
Reduction Ratio	80		Frame Size: 50; Reduction Ratio: 80; Size: 50
Maximum Input Speed	3500	r/min	Frame Size: 50; Reduction Ratio: 80; Size: 50
Average Input Speed	2500	r/min	Frame Size: 50; Reduction Ratio: 80; Size: 50
Wave Generator T	21.8^+0.1_0 / 24.8^+0.1_0 / 25.3^+0.1_0	mm	Varies by published configuration.
Wave Generator U	φ19H7 / φ22H7		Varies by published configuration.
Wave Generator W	6JS9/P9 / 8JS9/P9		Varies by published configuration.
Torsional Rigidity K2	40	×10⁴ N·m/rad	Frame Size: 50; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 50
Torsional Rigidity K1	25	×10⁴ N·m/rad	Frame Size: 50; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 50
Torsional Rigidity K3	44	×10⁴ N·m/rad	Frame Size: 50; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 50
Torsional Rigidity T2	382	N·m	Frame Size: 50; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 50
Torsional Rigidity T1	108	N·m	Frame Size: 50; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 50

Dimensional & Integration Overview

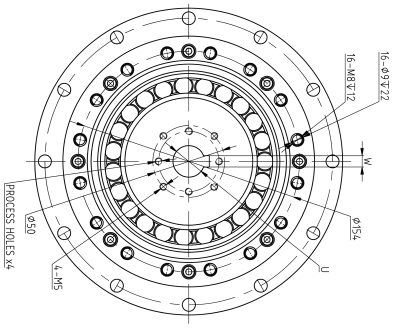
Mechanical Overview

PARAMETER	VALUE	UNIT
Frame Size	50	
Weight	9.6	kg
Wave Generator Dimension T	24.8+0.10 / 21.8+0.10 / 25.3+0.10	mm
Wave Generator Bore U	φ22H7 / φ19H7	
Wave Generator Keyway W	8JS9/P9 / 6JS9/P9	

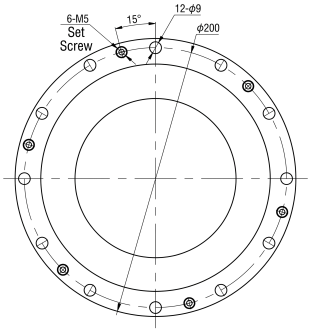
Dimensional Drawings



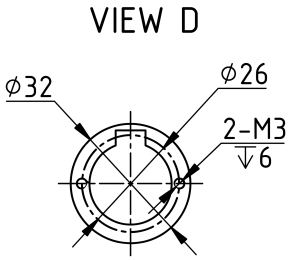
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 1	Overall width	63 mm
	Partial width	39 mm
	End step width	5 mm
	Maximum clearance	MAX 2.5 mm
	Minimum clearance	MIN 2 mm
	Outer diameter with deviations	Diameter 214 mm, upper deviation -0.02 mm, lower deviation -0.05 mm
	Bore diameter fit	Diameter 175 H7
	Maximum diameter limit	MAX diameter 113 mm
	Minimum diameter limit	MIN diameter 133 mm
	Shaft diameter fit	Diameter 170 h6
	Outer diameter fit	Diameter 214 h7
	Datum T	
	Datum D	
	Component label	Wave Generator A
	Bottom partial width	26.8 mm, upper deviation 0 mm, lower deviation -0.1 mm
		29.2 ±0.2 mm

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 2	Tapped holes, 16x M8, depth 12mm, evenly distributed	16× M8 threaded holes, depth 12 mm, evenly distributed on bolt circle
	Through/counterbore holes, 16x φ9, depth 22mm, evenly distributed	16× φ9 mm holes, depth 22 mm, evenly distributed on bolt circle
	Flange outer diameter φ154 mm	φ154 mm
	Process holes × 4	4× process holes (tooling/assembly aid holes)
	Tapped holes, 4x M5	4× M5 threaded holes
Mechanical View 3	Through hole quantity and diameter	12 holes, diameter 9 mm
	M5 set screw quantity	6 M5 set screws
	Hole angular spacing	15 degree angular spacing
	Bolt circle diameter	Diameter 200 mm bolt circle
Mechanical View 4	View designation	View D
	Diameter 32	Diameter 32 mm
	Diameter 26	Diameter 26 mm
	Two M3 threaded holes	2x M3 threaded holes
	Thread hole depth	Depth 6 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.