

PRODUCT DATASHEET

ES-HG-S08-F20-R120

Precision Transmission Component

Hat Harmonic Gearboxes | High-Torque Hat Unit Type II

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
Backlash	≤20	arc sec
Frame Size	20	
Weight	0.72	kg

Technical Specifications

PARAMETER	SPECIFICATION	UNIT	NOTES
PERFORMANCE			
Rated Torque	52	Nm	Frame Size: 20; Reduction Ratio: 120; Size: 20
Instantaneous Maximum Torque	191	Nm	Frame Size: 20; Reduction Ratio: 120; Size: 20
Start/Stop Peak Torque	113	Nm	Frame Size: 20; Reduction Ratio: 120; Size: 20
Backlash	≤20	arc sec	Reduction Ratio: 120; Size: 20; Frame Size: 20
Allowable Average Torque	64	Nm	Frame Size: 20; Reduction Ratio: 120; Size: 20
Starting Torque	4.2 / 0.042	Nm	Frame Size: 20; Reduction Ratio: 120; Size: 20 / Reduction Ratio: 120; Size: 20; Frame Size: 20
Angular 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	12.8+0.10 / 16.3+0.10 / 9.4+0.10	mm	Varies by published configuration.
Wave Generator Bore U	φ14H7 / φ11H7 / φ8H7		Varies by published configuration.
Wave Generator Keyway W	3JS9/P9 / 5JS9/P9 / 4JS9/P9		Varies by published configuration.

Technical Specifications

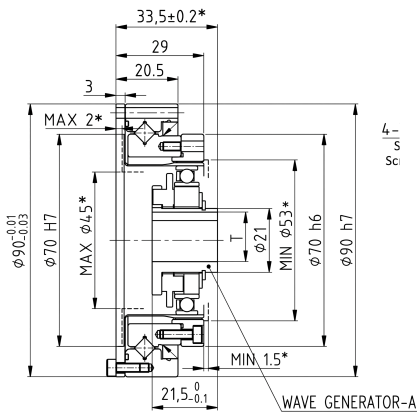
PARAMETER	SPECIFICATION	UNIT	NOTES
RELIABILITY			
Design Life	15000	h	Frame Size: 20; Reduction Ratio: 120; Size: 20
ADDITIONAL SPECIFICATIONS			
Reduction Ratio	120		Frame Size: 20; Reduction Ratio: 120; Size: 20
Maximum Input Speed	6500	r/min	Frame Size: 20; Reduction Ratio: 120; Size: 20
Average Input Speed	3500	r/min	Frame Size: 20; Reduction Ratio: 120; Size: 20
Wave Generator T	$12.8^{+0.1}_0 / 16.3^{+0.1}_0 / 9.4^{+0.1}_0$	mm	Varies by published configuration.
Wave Generator U	$\phi 11H7 / \phi 14H7 / \phi 8H7$		Varies by published configuration.
Wave Generator W	3JS9/P9 / 4JS9/P9 / 5JS9/P9		Varies by published configuration.
Torsional Rigidity K2	2.5	$\times 10^4$ Nm/rad	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity K1	1.6	$\times 10^4$ Nm/rad	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity K3	2.9	$\times 10^4$ Nm/rad	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity T2	25	Nm	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20
Torsional Rigidity T1	7	Nm	Frame Size: 20; Reduction Ratio: 120; Reduction Ratio Min: 50; Size: 20

Dimensional & Integration Overview

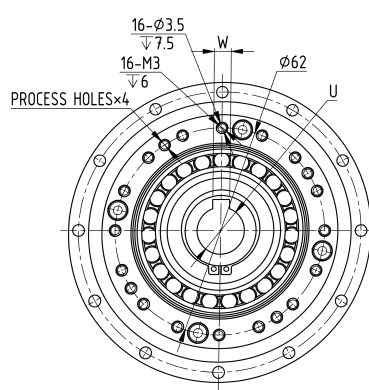
Mechanical Overview

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

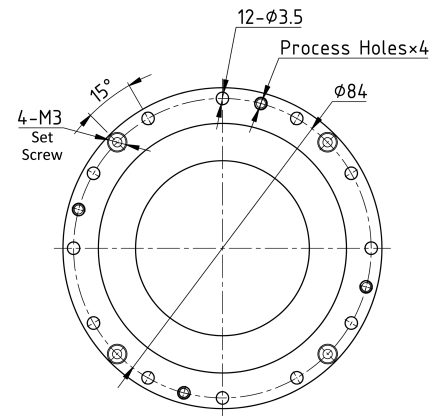
Dimensional Drawings



Mechanical View 1



Mechanical View 2



Mechanical View 3

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 1	Upper overall length	33.5 ±0.2
	Upper step length	29
	Upper inner length	20.5
	Left small step length	3
	Maximum clearance or protrusion	MAX 2
	Maximum shaft or clearance diameter	MAX diameter 45
	Minimum shaft or clearance diameter	MIN diameter 53
	Outer diameter tolerance	diameter 90 with upper deviation -0.01 and lower deviation -0.03
	Bore fit diameter	diameter 70 H7
	Shaft fit diameter	diameter 70 h6
	Shaft outer fit diameter	diameter 90 h7
	Inner diameter	diameter 21
	Minimum end clearance	MIN 1.5
	Bottom length with unilateral tolerance	21.5 +0/-0.1

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 2	Sixteen diameter 3.5 holes	16 holes, diameter 3.5
	Depth for diameter 3.5 holes	Depth 7.5
	Sixteen M3 threaded holes	16 M3 threaded holes
	Depth for M3 threaded holes	Depth 6
	Diameter 62 circular feature	Diameter 62
	W dimension label	Value not specified in this crop
	U interface label	Label U, value not specified
	Process holes, four places	Process holes ×4
Mechanical View 3	Twelve holes diameter 3.5	12 × Ø3.5 holes
	Process holes quantity	4 process holes
	Diameter 84 dimension	Ø84
	M3 set screws	4 × M3 set screws

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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.