

PRODUCT DATASHEET

ES-HG-S07-F45-R80

Precision Transmission Component

Hat Harmonic Gearboxes | High-Torque Hat Unit Type I

Product Overview

Precision Transmission Component with rated Torque 407 N·m, instantaneous Maximum Torque 1651 N·m and start/Stop Peak Torque 918 N·m.

Key Specifications

PARAMETER	VALUE	UNIT
Rated Torque	407	N·m
Instantaneous Maximum Torque	1651	N·m
Start/Stop Peak Torque	918	N·m
Reduction Ratio	80	
Maximum Input Speed	3800	r/min
Allowable Average Torque	507	N·m
Backlash	≤20	arc sec
Frame Size	45	
Weight	6.5	kg

Technical Specifications

PARAMETER	SPECIFICATION	UNIT	NOTES
PERFORMANCE			
Rated Torque	407	Nm	Frame Size: 45; Reduction Ratio: 80; Size: 45
Instantaneous Maximum Torque	1651	Nm	Frame Size: 45; Reduction Ratio: 80; Size: 45
Start/Stop Peak Torque	918	Nm	Frame Size: 45; Reduction Ratio: 80; Size: 45
Backlash	≤20	arc sec	Reduction Ratio: 80; Size: 45; Frame Size: 45
Allowable Average Torque	507	Nm	Frame Size: 45; Reduction Ratio: 80; Size: 45
Starting Torque	54 / 0.54	Nm	Frame Size: 45; Reduction Ratio: 80; Size: 45 / Reduction Ratio: 80; Size: 45; Frame Size: 45
Angular Transmission Accuracy	1	arcmin	Frame Size: 45; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 45
Hysteresis Loss	1	arcmin	Frame Size: 45; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 45
MECHANICAL			
Frame Size	45		Frame Size: 45; Reduction Ratio: 80; Size: 45
Weight	6.5	kg	Frame Size: 45; Reduction Ratio: 80; Size: 45
Wave Generator Dimension T	25.3+0.10 / 24.8+0.10 / 21.8+0.10	mm	Varies by published configuration.
Wave Generator Bore U	φ22H7 / φ19H7		Varies by published configuration.
Wave Generator Keyway W	6JS9/P9 / 8JS9/P9		Varies by published configuration.

Technical Specifications

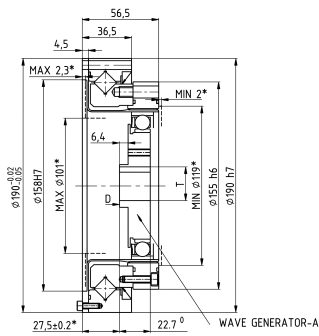
PARAMETER	SPECIFICATION	UNIT	NOTES
RELIABILITY			
Design Life	15000	h	Frame Size: 45; Reduction Ratio: 80; Size: 45
ADDITIONAL SPECIFICATIONS			
Reduction Ratio	80		Frame Size: 45; Reduction Ratio: 80; Size: 45
Maximum Input Speed	3800	r/min	Frame Size: 45; Reduction Ratio: 80; Size: 45
Average Input Speed	3000	r/min	Frame Size: 45; Reduction Ratio: 80; Size: 45
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	29	×10 ⁴ Nm/rad	Frame Size: 45; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 45
Torsional Rigidity K1	18	×10 ⁴ Nm/rad	Frame Size: 45; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 45
Torsional Rigidity K3	33	×10 ⁴ Nm/rad	Frame Size: 45; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 45
Torsional Rigidity T2	275	Nm	Frame Size: 45; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 45
Torsional Rigidity T1	76	Nm	Frame Size: 45; Reduction Ratio: 80; Reduction Ratio Min: 50; Size: 45

Dimensional & Integration Overview

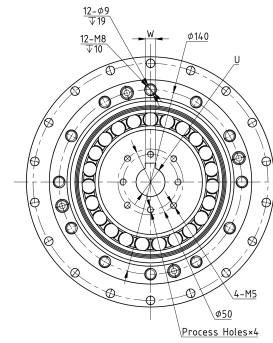
Mechanical Overview

PARAMETER	VALUE	UNIT
Frame Size	45	
Weight	6.5	kg
Wave Generator Dimension T	25.3+0.10 / 24.8+0.10 / 21.8+0.10	mm
Wave Generator Bore U	φ22H7 / φ19H7	
Wave Generator Keyway W	6JS9/P9 / 8JS9/P9	

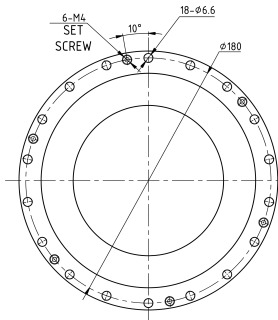
Dimensional Drawings



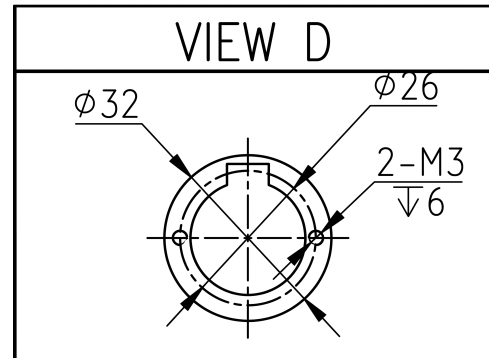
Mechanical View 1



Mechanical View 2



Mechanical View 3



Mechanical View 4

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 1	Top overall width	56.5
	Top inner width	36.5
	Upper left step offset	4.5
	Maximum clearance or protrusion	MAX 2.3
	Minimum clearance or protrusion	MIN 2
	Local transverse distance	6.4
	Left diameter with deviations	Diameter 190, upper deviation -0.02, lower deviation -0.05
	Fit diameter	Diameter 158 H7
	Maximum diameter	MAX diameter 101
	Minimum diameter	MIN diameter 119
	Fit diameter	Diameter 155 h6
		Diameter 190 h7
	Datum or local identifier D	D
	Datum or local identifier T	T
	Bottom mounting offset	27.5 ±0.2
	Bottom local distance with upper deviation	22.7, upper deviation 0, lower deviation Not specified
	Component label	Wave Generator-A

2D Drawing Dimensions & Callouts

VIEW	FIELD	VALUE
Mechanical View 2	12 through holes diameter and counterbore depth	12 holes, diameter 9, depth 19
	12 M8 threaded holes and depth	12 M8 threaded holes, depth 10
	Width designation W	W, value not specified in this crop
	Diameter 140	
	Position designation U	U, value not specified in this crop
Mechanical View 3	Through hole quantity and diameter	18 holes, diameter 6.6 mm
	Set screw quantity and thread size	6 M4 set screws
	Angular spacing	10 degrees
	Bolt circle diameter	Pitch circle diameter 180 mm
Mechanical View 4	View designation	View D
	Outer diameter	Diameter 32 mm
	Hole pitch circle diameter	Diameter 26 mm
	Threaded hole specification	2 × M3 threaded holes
	Unspecified numeric callout	9, feature not specified

[View Product Online](#)
[Request Engineering Data](#)
[Request a Quote](#)

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.