

CATEGORY SELECTION GUIDE

Hat Harmonic Gearboxes Category Selection Guide

Hat harmonic gearboxes use a high-torque shaft-input gear-unit architecture for compact precision rotary transmission. The catalog contains one Product Platform and 28 SKUs; confirm the mechanical interface first, then evaluate the torque profile, ratio, speed, accuracy and service life before confirming the exact SKU.

CATEGORY SELECTION GUIDE

CATEGORY	CURRENT CATALOG	REVISION / ISSUE
Hat Harmonic Gearboxes	1 Product Platforms / 28 SKUs	R01 2026-09-04

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01 | Category Scope and Objective

Product catalog and suitable use

Item	Current category
Product catalog	1 Product Platform / 28 SKUs
Suitable use	High-torque precision rotary transmission with a shaft-input unit for industrial and service robots, medical and analytical equipment, energy equipment, paper machinery and demanding automation axes.

02 | Typical Applications and Selection Inputs

Typical applications

Robotic joints and rotary axes Use the compact shaft-input architecture where the joint requires high torque density; match continuous, average and peak torque to the complete motion duty.	Machine tools and heavy automation For rotary tables, indexing and loaded axes, evaluate shock torque, torsional rigidity, ratio, speed and the mounting envelope as separate checks.	Medical, analytical and energy equipment Record accuracy, service life, environment and integration constraints before confirming the Product Platform and SKU.
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Inputs to record before shortlisting

01	Installation and shaft interface	Record flange, shaft input, output interface, frame and surrounding bearing or coupling arrangement.
02	Torque duty	Record rated operating torque, duty-cycle average torque, start/stop peaks and momentary shock events.
03	Ratio and speed	Record required output speed, motor speed, reduction ratio and maximum and average input speed.
04	Rigidity, accuracy and life	Record torsional rigidity, angular transmission accuracy, backlash and design-life requirements.

03 | Product Platform Architecture

Shaft-input navigation group

The Product Platform grouping supports catalog navigation and application positioning; it is not the first exclusion condition.

High-Torque Shaft-Input Gear Unit Product Platform This Product Platform contains 28 SKUs and combines a shaft-input mechanical interface with a high-torque harmonic gear unit. Use the group for catalog navigation; confirm frame, ratio, torque, speed, accuracy and mounting at SKU level.	
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04 | Product Platform Directory

Current Product Platforms



High-Torque Shaft-Input Gear Unit Product Platform

This Product Platform contains 28 SKUs. Retain candidates by the shaft and flange envelope, then compare reduction ratio, continuous and peak torque, input speed, backlash, angular transmission accuracy, design life and weight before confirming the exact SKU.

28 SKUs

05 | Platform Comparison and Trade-offs

Product Platform selection inputs

Product Platform	Mechanical interface	Torque and speed duty	Accuracy and integration
High-Torque Shaft-Input Gear Unit Product Platform	Shaft-input unit; confirm shaft, flange, output and frame interfaces at SKU level.	Compare Rated Torque, Allowable Average Torque, Start/Stop Peak Torque and Instantaneous Maximum Torque; then check Maximum and Average Input Speed.	Check Backlash, Angular Transmission Accuracy, design life, rigidity and mounting conditions.

06 | Application Sizing and Interface Planning

Recommended selection sequence

01	Confirm the mechanical interface Confirm shaft input, flange, output interface, frame and installation envelope.
02	Define the torque profile Define continuous, duty-cycle average, start/stop peak and momentary shock torque before screening SKUs.
03	Match ratio and speed Balance motor speed and required output speed, then check maximum and average input-speed limits.
04	Check rigidity, accuracy and life Check torsional rigidity, angular transmission accuracy, backlash and service-life requirements independently.
05	Confirm the SKU Confirm the remaining SKU against its complete parameter set, dimensional interfaces and controlled engineering documents.

07 | SKU Refinement

Parameters used to move from Product Platform to SKU

Standard parameter	Refinement role	Published values
Frame Size	Use the published frame value to retain a mechanical envelope candidate.	14 / 17 / 20 / 25 / 32 / 40
Reduction Ratio	Match the reduction ratio to motor speed, required output speed and reflected load.	100 / 120 / 50 / 80 / 160
Rated Torque	Compare continuous operating torque with the published rated value.	10 / 7 / 31 / 21 / 29 / 52 / 33 / 44 / 87 / 51 / 82 / 178 / 99 / 153 / 345 / 382 / 268
Start/Stop Peak Torque	Check acceleration, reversal and stopping peaks.	36 / 23 / 30 / 70 / 44 / 56 / 107 / 113 / 120 / 73 / 96 / 204 / 217 / 229 / 127 / 178 / 433 / 459 / 484 / 281 / 395 / 738 / 802 / 841 / 523 / 675
Allowable Average Torque	Check duty-cycle average torque; do not substitute it for a peak value.	14 / 9 / 51 / 34 / 35 / 64 / 44 / 61 / 140 / 72 / 113 / 281 / 217 / 484 / 586 / 255 / 369
Instantaneous Maximum Torque	Check short momentary shock events separately from the start/stop limit.	70 / 46 / 61 / 143 / 112 / 91 / 113 / 191 / 127 / 165 / 369 / 395 / 408 / 242 / 332 / 841 / 892 / 497 / 738 / 1400 / 1530 / 1270
Maximum Input Speed	Confirm the input-speed ceiling for the selected ratio and duty.	8500 / 7300 / 6500 / 5600 / 4800 / 4000
Average Input Speed	Check expected average input speed over the complete duty cycle.	3500 / 3000 / 3500 / 3500 / 3000
Backlash	Use the published value when assessing reversal and positioning behavior.	□20
Angular Transmission Accuracy	Compare the published accuracy value with the positioning requirement.	1.5 / 1
Design Life	Compare the published value with the project service target and duty assumptions.	15000 / 10000 / 15000 / 10000
Weight	Include exact SKU weight in moving-mass and mounting calculations.	0.66 / 0.9 / 1.29 / 1.99 / 4 / 7

SKU confirmation sequence

01	Filter by interface, frame and ratio Retain SKUs that fit the shaft/flange envelope and required reduction ratio.
02	Check the complete torque profile Check rated, average, start/stop peak and momentary torque as separate limits.
03	Check speed, accuracy and life Use exact SKU values for maximum and average input speed, backlash, angular transmission accuracy and design life.
04	Confirm the SKU Confirm shaft, flange, output, lubrication, sealing and controlled documents for the exact SKU.

08 | Engineering Information Checklist

Record before RFQ or engineering evaluation

01	Motion function	Axis function, direction, reduction ratio, output speed and motion profile.
02	Load and duty	Continuous, average, start/stop peak and momentary shock torque, duty cycle and thermal assumptions.
03	Mechanical interface	Shaft input, flange, output, frame, mounting, bearing arrangement and coupling.
04	Rigidity, accuracy and life	Torsional rigidity, backlash, angular transmission accuracy, repeatability target and design life.
05	Environment and integration	Lubrication, sealing, contamination, temperature and service conditions.
06	Required documents	SKU Product Datasheet, Dimensional & Integration Guide, 2D drawing and controlled 3D resources.

09 | Engineering Use and Verification Notice

Controlled engineering documents

01	SKU Product Datasheet	Use the current document for exact SKU parameters and configuration verification.
02	Dimensional & Integration Guide	Use the applicable guide and 2D drawing for shaft, flange, output, envelope and installation details.
03	Controlled 3D resources	Request STEP or native CAD for the exact SKU through the controlled engineering-file process.

Final verification statement

This guide supports preliminary Product Platform and SKU selection. Before design freeze, procurement or use, verify the exact SKU, mechanical interfaces, application loads, environmental conditions and current controlled engineering documents. Do not derive missing torque, compatibility or performance values from a SKU code, Product Platform name, adjacent SKU or a single rated value.