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CCTY

COMPANY PROFILE

Transform the Future with CCTY

In the dynamic world of humanoid robotics, manufacturers need agile, reliable bearing solutions to enable fluid motion control. CCTY is the trusted partner they turn to.

Unmatched Expertise and Innovation

Since 1996, CCTY has been collaborating with original equipment manufacturers – creating application-specific solutions that set new industry standards.

Our state-of-the-art 190,000 sqm manufacturing facility integrates critical processes onsite, ensuring unparalleled quality control and rapid design response. This technology, combined with our team of skilled engineers, leverages the latest advancements in motion control to deliver innovative, high-quality solutions.

Global Reach, Local Expertise

With factories in Zhenjiang and Xuyi, China, and Hai Phong, Vietnam, CCTY offers global engineering support, sales, and warehousing through strategic branch offices in China, the United States, Germany, India, and Japan.

Choose CCTY - Your Ultimate Partner in Motion Control

Experience the CCTY difference and take your humanoid robotics to the next level.

UNIQUE DESIGN

REDUCE WEIGHT

ONE DAY RESPONSE

ENGINEERING SUPPORT

Spherical Plain Bearing Unit

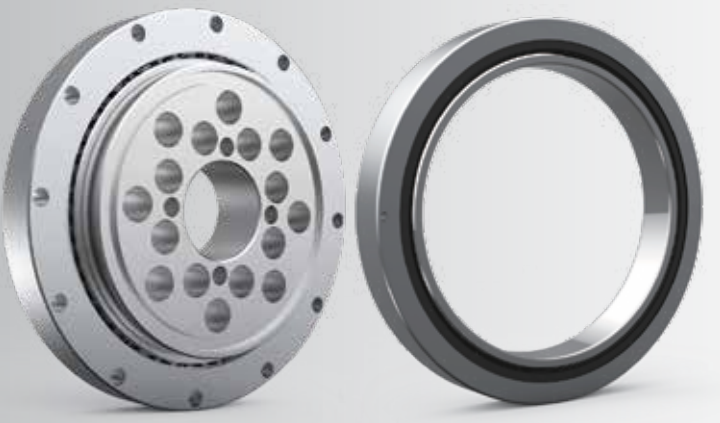
Rod ends & Linkages W / Spherical Plain Bearings

Technical Parameters	Units	Values
Clearance, Max	μm	0.2 (On Request)
Friction Torque, Max	Nm	0.025 (On Request)
Angular Misalignment	°	⩽ ± 35
Operating Temperature	°C	-40 - 120
Corrosion Resistance	Hours	up to 720
Seal	—	Seal / Boot
Lubrication Method	—	Grease / Self-Lubrication
Sliding Contact Surface	—	Steel / Steel - Steel / PTFE
Material	—	Stainless Steel / Steel
Bore Size	mm	⩾ 3

Bushings

Cylindrical Bushings, Flanged Bushings, Washers

Technical Parameters	Units	Values
Material	—	Steel Backed, Porous Bronze Sintered, PTFE Impregnated Composite
Load Capacity	MPA	Static - 250 Dynamic - 140
Operating Temperature	°C	-200 - 280
Lubrication Method	—	Self-lubricated
Maximum Sliding Speed - Dry	m/s	2.5
Coefficient of Friction	—	0.02 - 0.20
Cylindrical Bushing Bore Size	mm	⩾ 2.5
Flanged Bushing Bore Size	mm	⩾ 2.5



Crossed Roller Bearings

Technical Parameters	Units	Values
Clearance	μm	CC0 / C0
Friction Torque, Max	Nm	0.5
Operating Temperature	°C	-40 - 120
Accuracy	—	P0 / P6 / P5 / P4
Seal	—	with or without Seal
Lubrication Method	—	Grease
Material	—	Alloy steel
Bore Size	mm	⩾ 10

Ball Bearings

4-Point Contact, Flexible

Technical Parameters	Units	Values
Clearance	μm	C0 / C3
Operating Temperature	°C	-40 - 120
Accuracy	—	P0 / P6 / P5 / P4
Seal	—	with or without Seal
Lubrication Method	—	Grease
Material	—	Bearing Steel
Bore Size	mm	⩾ 20

Angular Contact Ball Bearings

Technical Parameters	Units	Values
Contact angle	°	30 / 40
Operating Temperature	°C	-40 - 120
Accuracy	—	P0 / P6 / P5 / P4
Seal	—	with or without Seal
Lubrication Method	—	Grease
Material	—	Bearing Steel
Bore Size	mm	⩾ 20

PRODUCT CHARACTERISTICS

Robotic Bearings Applications & Benefits

Bearing Type	Key Features		Applications
Crossed Roller Bearings	• High Load Capacity • Low/Negative Clearance • Low Friction • Compact Design	• Long Lifespan • High Running Accuracy • Excellent Rigidity	Rotary actuators in robots.
Flexible Ball Bearings	• Flexible • Low Friction	• High Accuracy • Compact Design	Rotary actuators in robots.
Spherical Plain Bearings, Rod Ends & Linkages	• Low Clearance • Low Torque • High Misalignment Angles (±35°)	• Self-lubricating Liners • High Load Rating • High Wear Resistance	Linear actuators, linkages and rod ends in robots.
Angular Contact Ball Bearings	• High Load Capacity • Supports Radial & Axial Loads in One Direction	• Low Friction at High Speeds • High Accuracy • Long Lifespan	Linear actuators in robots.
4-Point Contact Ball Bearings	• Low Friction • High Accuracy • Support Radial & Axial Loads in Both Direction	• Compact Design • Long lifespan • High Load Capacity	Linear actuators in robots.
Bushings	• Long Service Life • Self Lubricating • High Stiffness • Thin Section	• High Load Capacity • Low Friction Coefficient	Humanoid robotic hands, rotary actuators, linear actuators and linkages.

PRODUCT CHARACTERISTICS

Balancing Torque and Clearance for Optimal Accuracy

Impact of Torque on Robotics

Effective management of friction torque is essential for optimizing robotics performance and efficiency. Proper torque ensures smooth operation and reduces the risk of premature wear and failure.

Conversely, excessive torque accelerates wear and diminishes battery efficiency, as high friction in bearings demands more energy to maintain operation. It can also result in motion hysteresis, which prevents smooth operation.

Impact of Clearance on Robotics

Clearance, the play between components, is a challenging specification to control in robotics. High clearance can cause delays in motion transfer and compromise precision.

Too much clearance can increase component wear and rattling noise from vibrations, ultimately reducing the bearing's lifespan.

Minimizing Torque and Clearance

Minimizing torque and clearance is crucial for enhancing robotic accuracy, precision, and efficiency. While ideal conditions are zero torque and zero clearance, proper calibration of these factors can make a significant difference.

This strategic approach minimizes energy consumption, maintains high precision, and extends the operational lifespan of robotic platforms.

Engineered Bearings for Robots

Enhancing Robotics Through Customized Bearing Solutions

Bearings play a crucial role in robotics, ensuring precise and sead seamless motion. Customized bearings, designed specifically for individual applications, offer superior functionality, efficiency, and adaptability compared to standard, off-the-shelf options.

These tailored bearings enhance performance by aligning key parameters—such as load capacity, misalignment angle, friction, and clearance—with the specific requirements of each application.

Optimizing Performance

Customized bearings allow engineers to fine-tune parameters to specific application needs, boosting operational efficiency, movement precision and accuracy. This optimization can also reduce the weight and size of mechanical joints.

To enhance performance, fine-tuning includes adjusting load capacity, misalignment angle, friction, clearance, and lubrication-for-life options.

Streamlining the Assembly Process

Customized bearings integrate seamlessly into complex robotic designs, simplifying the assembly process. They allow for precise adjustments to movement needs and environmental conditions, improving system reliability.

PRODUCT CHARACTERISTICS

Materials and Seals for Robust Performance

Importance of Weather-Resistant Materials

Robotics' durability and reliability in diverse environmental conditions heavily depend on weather-resistant materials and effective sealing solutions. These elements are essential for protecting robotic systems from UV, ozone, corrosion, moisture, temperature fluctuations, and other environmental challenges.

Effective Sealing Solutions

Effective sealing solutions are crucial for preventing contaminants from entering bearings and lubricants from escaping. This is essential for maintaining optimal functionality.

Robust seals, including sliding seals and specially designed boot enclosures, create barriers against moisture, mud and other contaminants. Additionally, these seals are resistant to UV and ozone damage, further safeguarding internal mechanisms.

Enhancing Resilience with Materials and Seals

Integrating weather-resistant materials and reliable sealing solutions significantly enhances robotic resilience. This approach extends operational capabilities in challenging environments and is increasingly vital as robotic applications diversify.

CCTY

China

CCTY Company

458 Jinrun Boulevard, Zhenjiang, China, 212141

Tel:+86-511-88883388

E-mail: info.cn@cctygroup.com

North America

CCTY Company

1111 Rose Road, Lake Zurich, IL60047, USA

Tel:+1-847-540-8196

E-mail: info@cctygroup-us.com

Europe

CCTY GmbH

Gewerbepark West 5, 97525 Schwebheim, Germany

Tel: +49-(0)-9723-9339-000

E-mail: info.de@cctygroup.com

India

CCTY India Pvt. Ltd.

Survey no. 12/1 & 12/2, N.H. 48, Manglej,

Tal. Karjan, Dist. Vadodara, Gujarat, India - 391243

Tel: +91 96876 33753/+91 98230 17144

E-mail: info.in@cctygroup.com

Japan

CCTY Company

11-5 Shiba 4-chome Minato-ku

Tokyo 108-0014 Japan

Tel: +81-3-5444-4451

E-mail: info.jp@cctygroup.com

Vietnam

CCTY Company Limited

Lot CN16-06, Nam Dinh Vu Non-tariffand Industrial Park (zone 1),

within DinhVu-Cat Hai Economic Zone, Dong Hai 2 ward,

Hai An district, Hai Phong city, Vietnam

E-mail: info.vn@cctygroup.com