

### **RollerDrive CNC™** The answer for a CNC rotary axis

#### Pure Motion By Zero-Backlash Technology

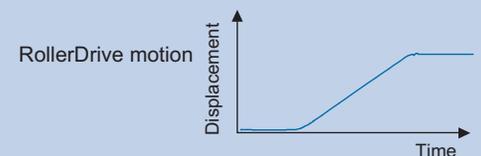
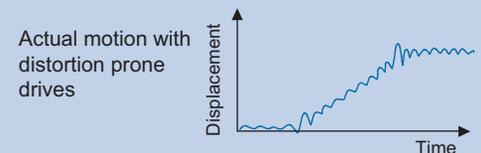
The RollerDrive CNC, a CNC rotary table, is designed to fulfill the demands of the latest machine tools for increased speed and precision. Inside, the RollerDrive CNC uses a RollerDrive, our zero-backlash reducer which transmits motion without distortions while staying robust against external forces unlike existing gears and torque motors. The high precision and rigidity achieved by the zero-backlash technology gives the RollerDrive CNC a rotational accuracy of less than  $\pm 10$  arc sec. and outstanding toughness while doing heavy cutting work on hard metals.

#### No Clamp Operation

The RollerDrive CNC does not require a clamp operation due to its mechanically rigid zero-backlash structure. This eliminates clamp and unclamp time, and requires no energy like conventional hydraulic systems. Combined, the distortion-free performance and no-clamp design delivers ultra fast positioning that leads to higher productivity. For instance, a typical 90-degree rotation can be done within 0.4 seconds.

#### Perpetual Precision

The unique mechanism of the RollerDrive makes the RollerDrive CNC capable of withstanding years of operation without internal part wear or loss of precision. Regular calibration or readjustment work is unnecessary for the RollerDrive CNC.



## Technitron

**Integration Services**  
[www.technitron.com](http://www.technitron.com)

## Mechanism

### Performance By Zero-Backlash Technology

The main part of the RollerDrive mechanism consists of an input shaft and an output turret in which roller followers are embedded. An integral cross-roller bearing supports the output turret with minimal run out.

Preloaded roller followers contact the input rib surfaces with a wedge-shaped cross section, which can be adjusted by moving the input axis, to eliminate backlash completely. No backlash means superior precision and stiffness for both CW and CCW rotation, as shown on the diagram to the right.

Even with preload and zero-backlash, the needle-bearing type roller followers transmit power by rolling rather than sliding making it possible for the RollerDrive to achieve an outstanding efficiency of 90% or more and life-time wear-free durability.

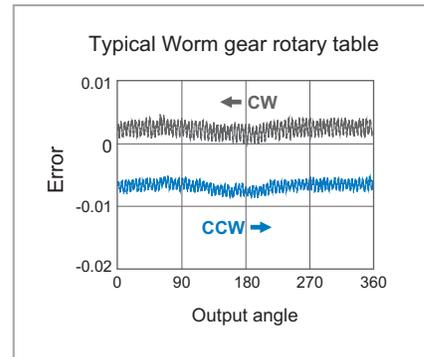
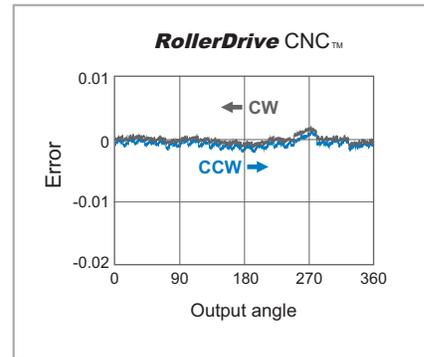
All parts are made from only qualified alloy steels, and machined and ground with our ultra-precision machining system.

## Approved Performance

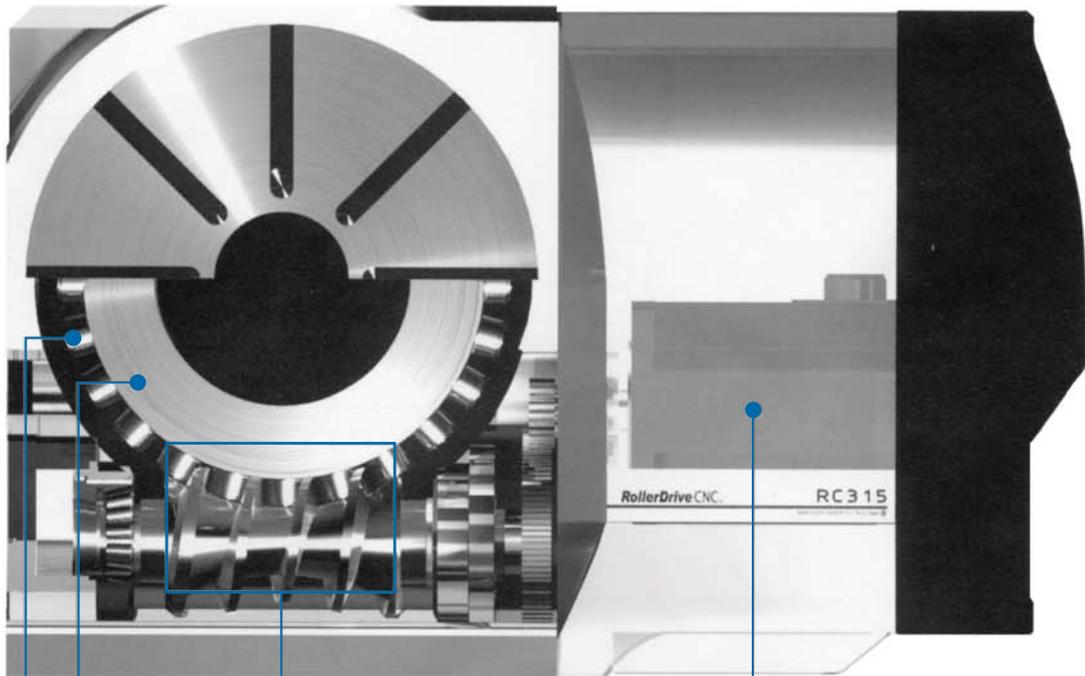
### Be Distinctive

RollerDrive product series are widely used in various industries that require the highest in performance levels. Machine tool companies are not an exception and RollerDrive technology is already being applied to the world's leading machine tools.

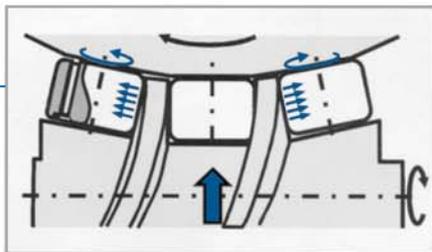
The "RollerDrive QUALITY" logo encompasses rotary axis speed, precision, and mechanical stiffness - essential performance qualities for standing up to heavy cutting work. This logo is available to RollerDrive users to make their applications distinctive in their market. Contact Sankyo America, Inc. for details on the use of this logo.



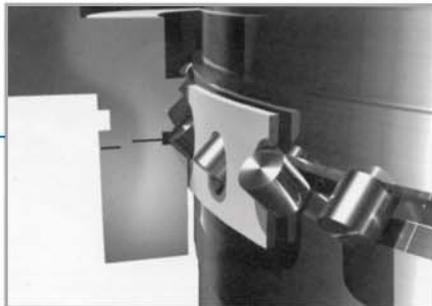
by Sankyo America, Inc.



**Servo Motor**



Preload + Rolling contact achieves zero-backlash and long life



Outstanding rotating accuracy and rigidity with the integrated cross roller bearing

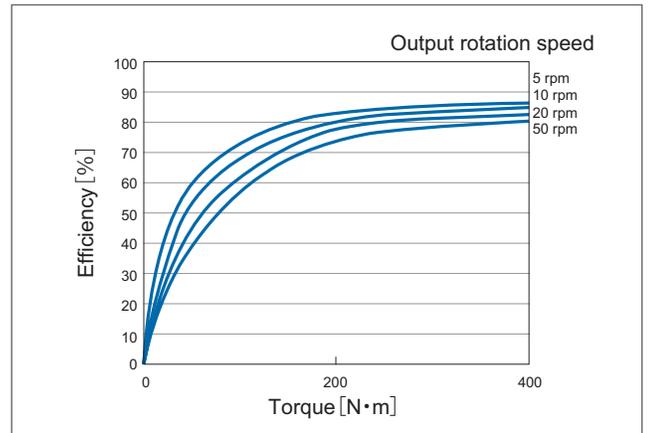


Shock resistant and high performance cam followers

## Efficiency

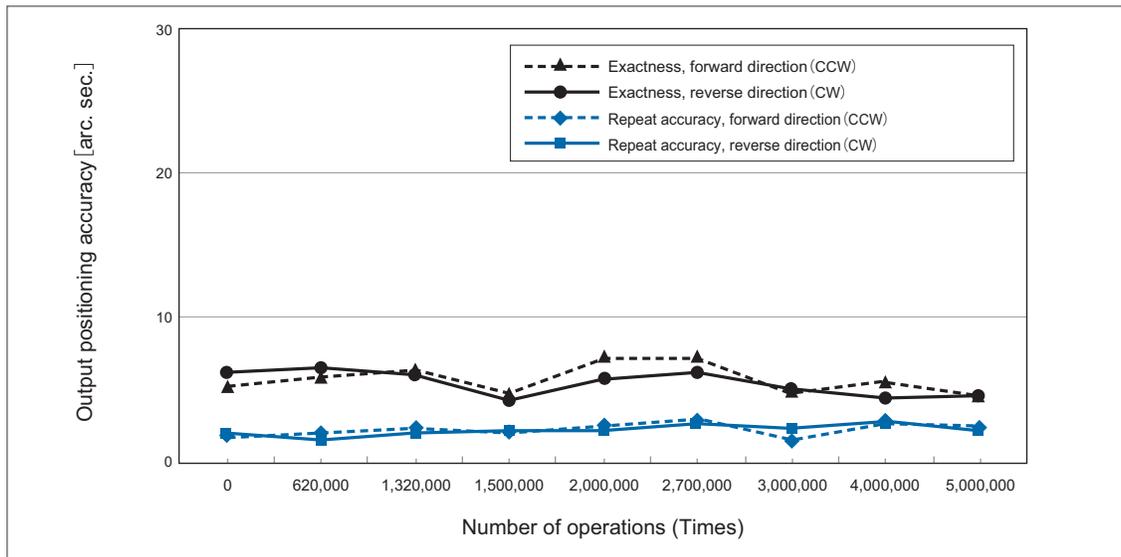
This indicates the percent of input power which is transmitted to the output. The **RollerDrive®** motion mechanism has high efficiency because it employs rolling contact. Efficiency varies depending on conditions such as load torque, rotation speed and temperature.

### RC250



## Durability

**RollerDrive®** Test of changes in RollerDrive positioning accuracy over time



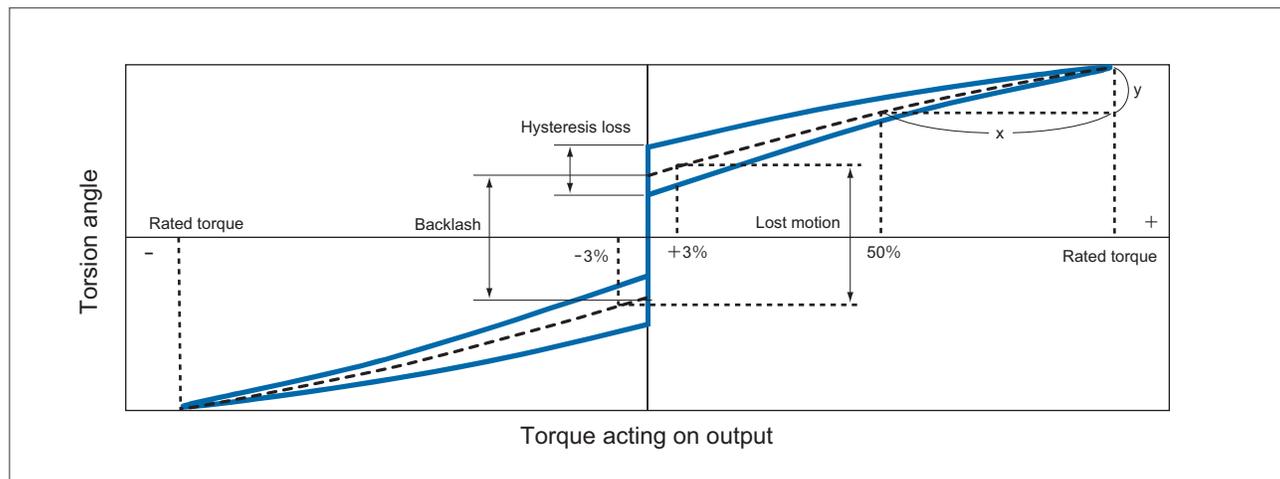
Test Conditions	
RollerDrive size	RC250 class test machine
Output load weight	152 kg (φ500mm)
Output load moment of inertia	4.69 kg·m <sup>2</sup>
Output rotation angle	0-345 degree (Reciprocating)
Output maximum rotation speed	100rpm
Acceleration time	0.100 sec
Uniform speed time	0.475 sec.
Deceleration time	0.100 sec.

In the **RollerDrive®**, all rotating elements operate in a state of rolling contact, and thus there is almost no wear, or degradation in accuracy over time.

There is almost no change in positioning accuracy after testing operation (5) million times, and this shows that the outstanding accuracy of the **RollerDrive®** can be maintained over the long term.

## Backlash, Lost Motion & Hysteresis Loss

### General Hysteresis Graph

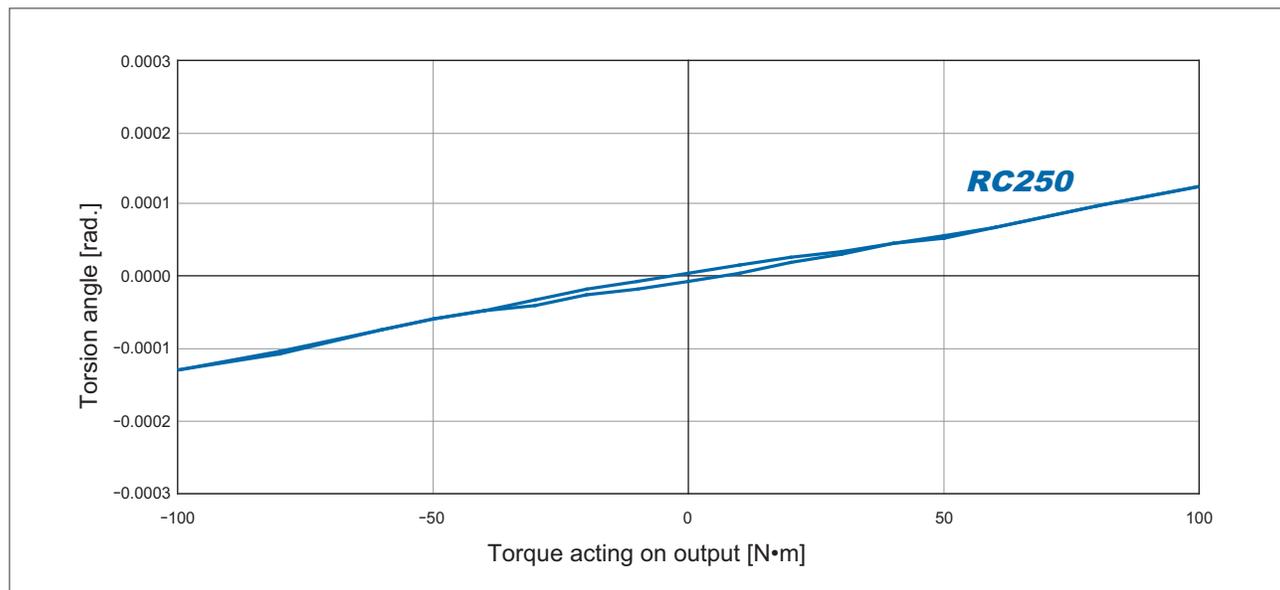


**Backlash** Rotation angle which can arise even with zero torque (looseness)

**Lost motion** Torsion angle of the midpoint of the hysteresis curve width which arises when applying  $\pm 3\%$  rated torque

**Hysteresis loss** Torsion angle where there is no complete return, when torque is applied in both forward and reverse directions

### **RollerDrive**® Hysteresis Graph



For a general reducer, the hysteresis graph can be obtained by applying torque to the output shaft, and plotting the generated torsion angle.

Backlash, lost motion and hysteresis loss can each be defined from the hysteresis graph, as indicated above.

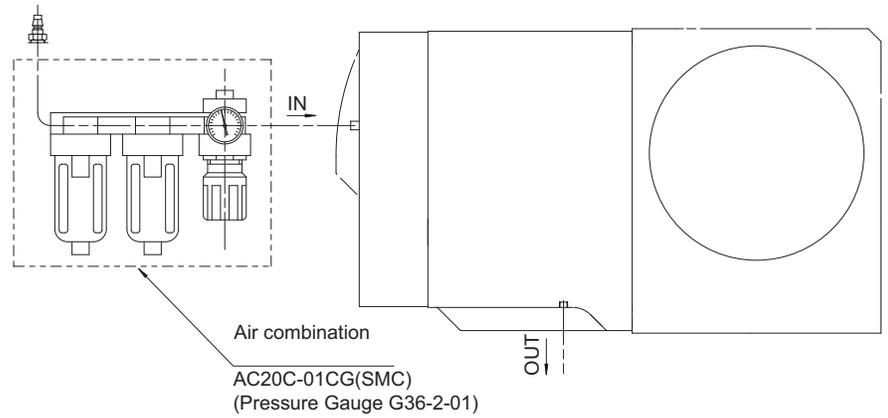
Lost motion and hysteresis loss depend on the material characteristics, and occur in all types of structures. Backlash, on the other hand, occurs only when there are gaps or looseness in the structure. Backlash has a major effect on accuracy, servo gain and similar factors, and must be minimized.

With **RollerDrive**®, backlash is completely eliminated using our unique preload structure, and lost motion and hysteresis loss are controlled to extremely small values due to the results of research on optimizing materials and structures.

## Notes On Air Supply

Sankyo's CNC Circular Table comes standard equipped with an air purge outlet. (Use it to blow out condensation and coolant to prolong the life of electrical parts and prevent rust in the motor housing.) Supply clean air for the air purge by referring to the drawing shown to the right.

(Do NOT block the exhaust outlet.)



## Lubrication

Sankyo's CNC Circular Table uses an oil bath to protect the internal mechanisms and maintain reliability. Refill and perform oil changes regularly using the oil listed in the instruction manual.

## Grinding Machine Applications

When used in grinding machines, the seal device on the outer periphery of our table may become damaged. The warranty does not cover any such damage.

## Maximum Rotation Speed

The maximum rotation speed for the table given in the specifications refers to the indexing speed. Consult with Sankyo if the table is to be rotated continuously. Otherwise, the table will heat up and lose accuracy, causing overload alarms with the servomotor.

## General Precautions

Under the United States trade regulation, RollerDrive CNC can be restricted to supply or export to a country which may produce weapons or related products.

Dimensions and specifications are subjected to be modified without notice.

Contents of this catalogue were published in 2013.

Whole or part of the contents, mechanisms, logos, drawings belongs to Sankyo America Inc. No part of the catalogue is allowed to copy or redistributed to the third party without the written permission of Sankyo America, Inc.