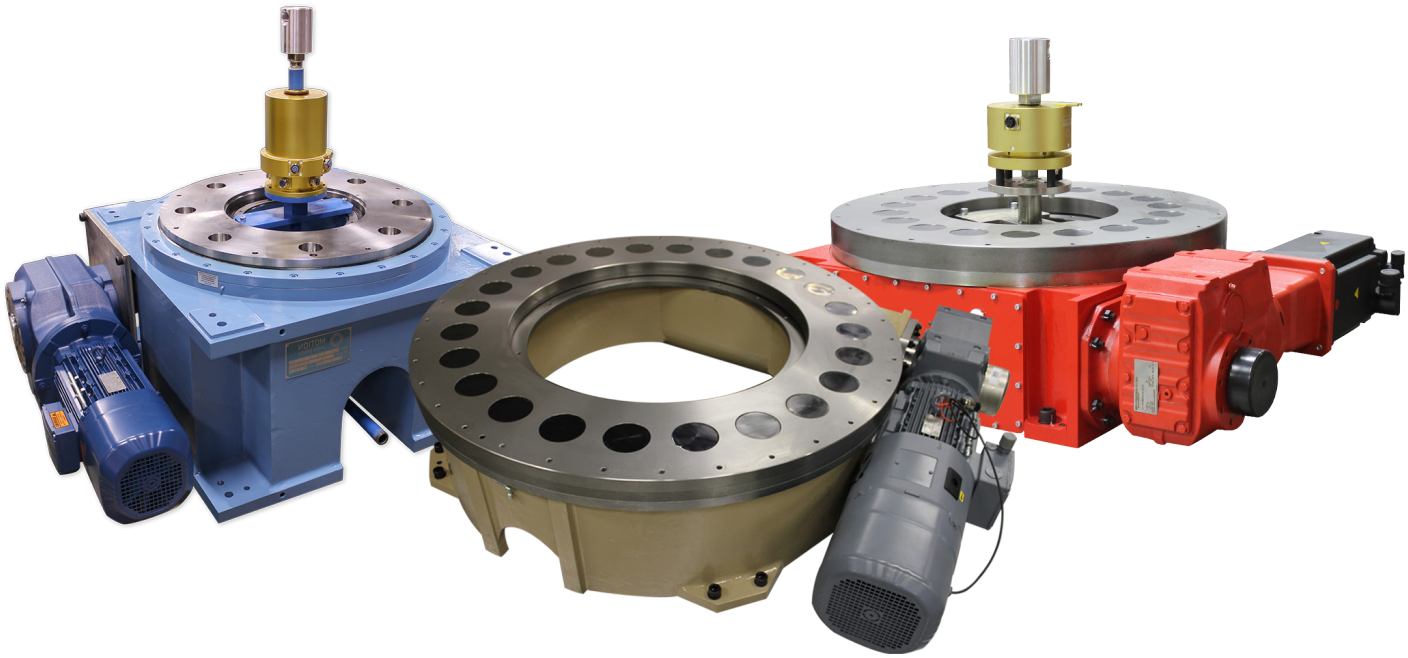
MOTION
INDEX DRIVES

Introductory

Product Training



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History of Engineered Precision

Since the early 1970's the I Series of Rotary Index Tables from Motion Manufacturing was proven to be a robust workhorse. After several million cycles in the demanding automotive industry, the I Series continued to run without a minute of downtime.

The I Series evolved into the E Series, bringing a more compact design and numerous other benefits to automakers. The new design kept the motor within the housing profile, reducing the footprint of the indexer and its attached systems significantly.

Today, after forty-seven years of constant development and improvement, Motion's RT Series has followed the iconic I Series and the innovative E Series. Over the years, Motion's indexers have been built to include low-friction internal components - creating indexers that require one-third the amperage and still produce greater torque than competitors' units. In addition, the RT Series comes in a pack-age 45% smaller than previous models, and is accurate up to ±0.008mm.

Developments in indexing technology have led to the inclusion of Motion indexers in new industries over the years. Motion products now drive processes for microelectronic assembly, medical equipment manufacturing, food and pharmaceutical processing, consumer goods manufacturing and many other industries.

Motion continues to build on its tradition of innovation. Motion's patented NANO Indexer Technology allows us to build the world's most accurate barrel cam driven devices. Continuous improvement of our process as a whole has reduced shipping times, improved cam designs (leading to a number of benefits) and in-creased our share of the global market.

Custom solutions are a growing part of Motion's business. Each inquiry brings with it a new environment or specification to adapt to. The rapid development of technologies manufactured mandates the rapid development of manufacturing technologies. Motion dedicates a portion of its work force to custom solutions in order to meet this challenge which has allowed us to expand our company into a new branch of custom products called Lazer Arc. This division includes Robot Transfer Units, Tool Tray Transfers Systems, single, 2, 3, 4, and 5 axis products.

Barrel Cams

Barrel Cams are the strongest of the three cam types. Comprised of a thru-hole for mounting to the input/output shaft and multiple grooves for cam followers, barrel cams go through a multi-stage process in creation.

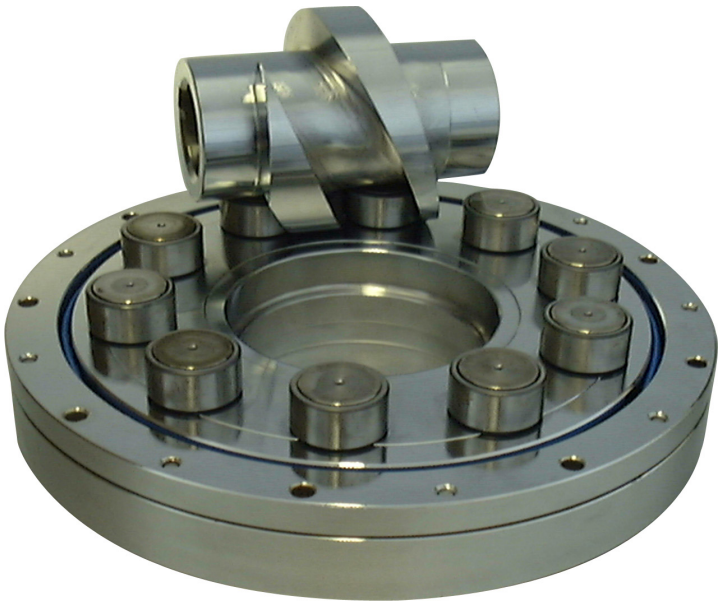
Barrel Cams are first milled from solid steel cylinders on acombination 3-axis CNC machine and lathe. After initial milling, cams are sent to a skilled craftsmen to go through a flame induction hardening process. After hardening, the surface of the cam needs to be re-milled and finally checked for accuracy and strength.

Barrel Cams can be identified by the groove walls, which are perpindicular to the center thru-hole (as opposed to tapered). These cams are used in conjuction with followers configured on the output (dial plate - see bottom left image on facing page). As a result, the combined weight of the cam, followers and large output give barrel cam tables the largest internal inertias, but also the greatest strength. Additionally, flexible index tables utilize Barrel Cams with special profiles. These cams have a constant lead and are easily distinguished from a Barrel Cam in a fixed indexer by their lack of dwell.

Check out our Video reference:
http://www.youtube.com/watch?v=2atiOFA-qnQ&feature=related
Barrel Cam seen from 0:00-0:36

Barrel Cams are present in the following Motion Index Drives products:

RT Series
TT Series
TMF Series
TSR Series
RH Series (rotation)
PH Series (lift)



Globodial Cams

Like barrel cams, Globoidal Cams are milled from cylinders of solid steel, but are designed for speed rather than strength. These cams feature a thru-hole for mounting to an input/ output shaft, as well as several groove for cam followers.

Globoidal Cams can be distinguished by the tapered walls of their grooves. Since cam followers are configured in a star array on the output, the Globoidal Cam must compensate for the angular difference between cam followers with its tapered walls.

To achieve the tapered walls in the cam follower grooves, Globoidal Cams are machined on a combination 5-axis CNC machine and lathe. After initial machining, these cams are sent to a skilled craftsmen for flame induction hardening, concluding with a second milling and quality check.

The configurating of globoidal cam and star shaft centralize the weight of a Globoidal Cam driven indexer's output, resulting in the lowest internal inertia values of Motion Index Drives' products. The extermely fast cycle times trade off for relative weakness.

Check out our Video reference:
http://www.youtube.com/watch?v=QIUfBFyNvFg

Globoidal Cams are present in the following Motion Index Drives products:

TG Series
TX Series
GH Series (rotation)

Flat Cams

Flat Cams are milled from slabs of steel and are distinctly different from the cylindrical cam designs. Flat Cams are distinguished by their shape (also called Disk Cams) and are used in Motion Index Drives' parallel indexers.

Flat Cams are designed for use in space-saving indexers. The thin design and simple manufacturing process makes Flat Cam driven indexers cost effective and practical where loading isn't required.

In order to achieve multiple dwells in a single cycle, multiple cams are used on the input shaft, mounted via a thru-hole and bolts to a hub. Cam followers are configured on a separate, parallel output shaft between hubs. Parallel indexers have relatively low internal inertia values when compared to barrel cam driven units.

Flat Cams are milled on a 3-axis CNC machine before being sent to a skilled craftsman for flame induction hardening. A second milling is completed to remove imperfections generated by hardening before quality testing.

Check out our Video reference:
http://www.youtube.com/watch?v=z0BoBSVXecg

Flat Cams are present in the following Motion Index Drives products:

XP Series
TP Series
GH Series (lift)
RH Series (lift)
PH Series (rotation)
RT+VT Series (lift)
AL Series (rotation & lift)

General Applications

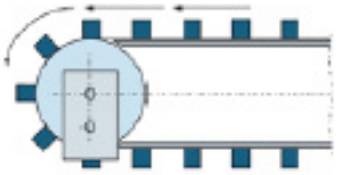
Converting a uniform input into an intermittent output makes indexers a powerful and necessary tool for automating any process. Some depictions of general application examples for indexers can be helpful in picturing an indexer in any industry.

Indexers are popular for the following tasks:

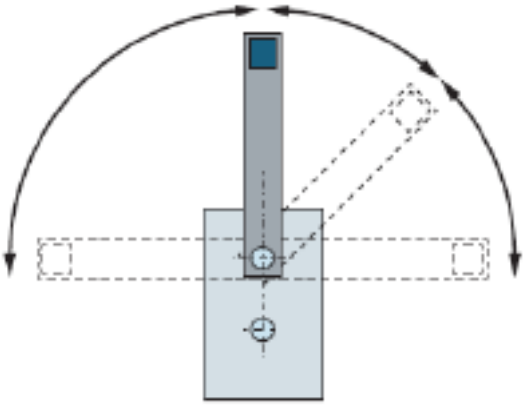
1. Conveyor Drive
2. Pivot Arm
3. Producing Linear Movement
4. Part Rotation
5. Manipulating and Isolation

Each of these examples can be applied in any number of settings. Whether the "Manipulating and Isolation" application is applied to boxing crayons or, in conjunction with a camera, quality checking syringes is up to the imagination of the engineer or salesman.

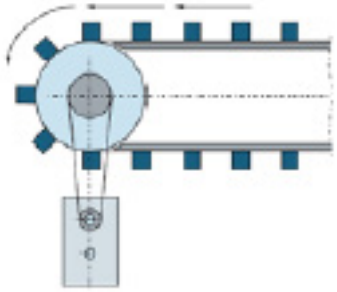
Direct Driven Belt /Chain



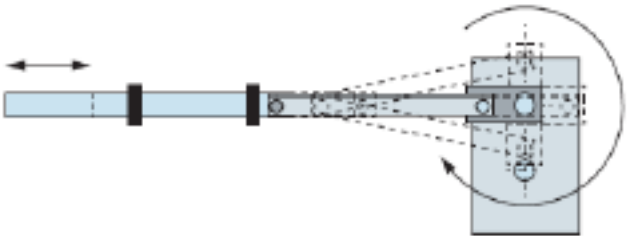
Arm



Indirect driven belt/chain

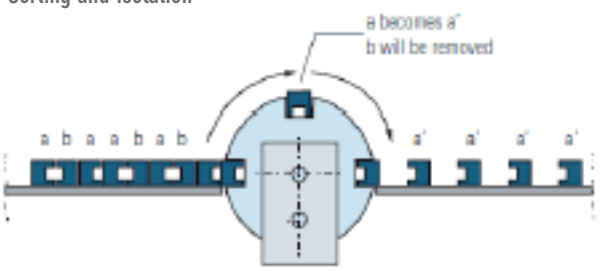


Transducer of rotations in horizontal movement



Rotate Part

Sorting and Isolation



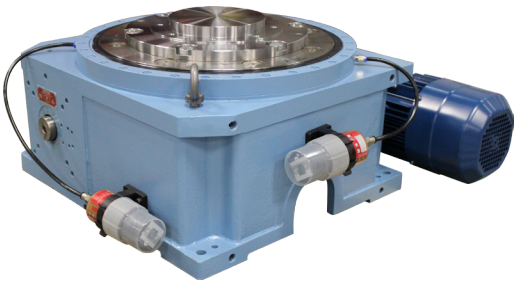
Rotary Index Tables

Rotary Index Tables are often the core component of an automation process. Their strength, precision and speed dictate the actions of the tooling around the table and the process as a whole. At Motion Index Drives, we understand that downtime is not an option when it comes to a rotary indexer, so we have spent the last 47 years developing rotary indexers that can maintain speed and precision for decades in the most demanding environments.

Motion's Rotary Index Tables include flame-hardened cams and cam followers, meaning our internal components can withstand forces that cause other manufacturer's thinner casings to crack. This strength, coupled with low friction components, allows Motion Index Drives to utilize tables several times smaller, more energy efficient and cost effective for the same task that would require a larger indexer from a competitor.

With a variety of options available, it is likely Motion Index Drives builds a Rotary Index Table to satisfy any project's requirements. If not, Motion Index Drives' custom design engineers can be put to work on adapting an existing solution or designing an entirely new one to meet a project's needs.

Each Rotary Index Table made by Motion Index Drives is given a cam profile to match the job. Shorter indexes and longer mechanical dwells are adjustments regularly made for a variety of applications.



RT & TT Series

Defining features of the RT & TT Series rotary index drives include low profile housing, barrel cam drive and rotary output. Cam followers are fixed to the top dial. The design is well suited for adaptation to new environments; special seals, materials, coatings and more can be applied to RT & TT Series indexers.

RT & TT Series indexers are used in an array of applications in automation processes for almost any industry imaginable. These units may have tooling permanently fixed to them, perhaps in a welding cell; act as a positioning device for products placed on its dial, such as a coining operation; a drive unit for indexed operation on conveyors in a bottling or manufacturing operation; or any number of other applications.

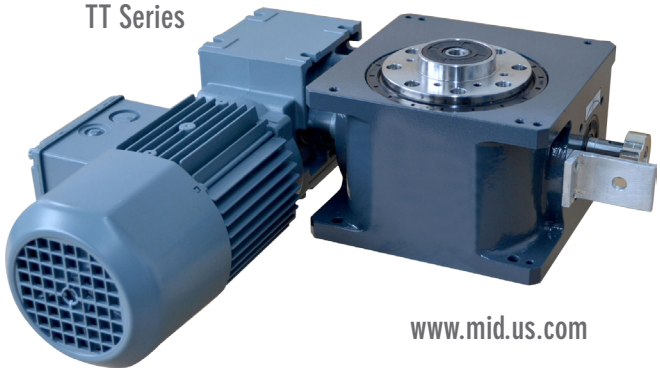
The RT Series features steel housing standard, while the TT Series offers standard aluminum in its smaller sizes (they are essentially the same design, the two Series are established for reasons associated with why the different sizes were designed in the first place). Both housing materials offer advantages (strength in steel; rust-free and lightweight aluminum).

RT & TT Series tables can operate in the standard horizontal position (top dial parallel to ground) or in the vertical "trunnion" (top dial perpindicular to ground). Trunnion configurations offer different engineering challenges, but also a distinctly different system. Trunnions are discussed more on pages X-XX.

Check out our Video reference:
http://www.youtube.com/watch?v=_nKmb4Upsaw
http://www.youtube.com/watch?v=KEbMUuD2teM

RT Series

TT Series



Flexible Index Tables

To understand a flexible indexer, we need to briefly cover the principles of a fixed indexer. Fixed indexers receive a constant power input from the motor, this input rotates the cam, which then rotates the output. It is clear in our videos that the output has a period where it stops (dwell), accelerates, reaches peak velocity and then decelerates before going back into dwell. Since the motor's input is constant and the output is intermittent with controlled accel and decel, we can conclude that the cam is responsible for the output's motion (it can be difficult to visualize, but the animations on our YouTube channel can help).

A fixed cam has grooves with distinct sections for dwell and indexing (accel, decel). A flexible cam has no distinct sections; it has a constant lead (the groove moves the output at a constant velocity if the motor is running at a constant velocity). These "constant lead" cams offer a high-precision mechanical transition of power to the output, in addition to increasing accuracy. Acceleration and deceleration are still necessary, but are now achieved by logic operating the indexer's motor.

Flex & TMF Series

FLEX Series rotary index tables adapt RT/TT/TSR Series designs for use with a constant lead barrel cam and the appropriate cam follower adaptations. These indexers offer a high precision, backlash-free re-programmable drive unit thanks to the precision-machined constant lead cam and preloaded cam followers. These tables are able to engage more cam followers (often 3) at a time than fixed indexers, resulting in increased strength.

The TMF Series design maximizes the principles and potential of the constant lead barrel cam. The TMF Series features a new dial plate design in order to maximize the number of cam followers in an indexer - engaging up to five at a time. The TMF Series will have the highest strength/size ratios among rotary index tables. A new, lower housing profile better accomodates the cam and new dial plate.

Motion's flexible indexers are used in high precision applications where fixed indexers aren't applicable (and even some where they are). These units can be used to speed up processes (such as movements from A to B to A to C to A, where a fixed indexer would need to stop at B twice more), or offer the security of a reprogrammable unit in an environment where processes may change.

Check out our Video reference:
http://www.youtube.com/watch?v=3s3UfAe1RqY
http://www.youtube.com/watch?v=PXriZz_zwTA

Parallel Index Drives

Sometimes an application calls for an indexer with unique qualities: specific dimensions, continuous operation capabilities, short indexes and long mechanical dwells. Motion Index Drives' Parallel Index Drives bring Motion's robust construction process and materials to the versatile parallel shaft design. Low friction internal components and the added bonus of less internal inertia thanks to the unit's disk cam configuration make these Parallel Drives one of the most energy efficient indexers available.

Parallel Indexers are great solutions for driving conveyors, acting as torque arms and performing tasks that require flipping or rotating tooling. In addition, Motion Index Drives can construct custom drives for continuous operation in an environment where a motor off mode of operation is not an option.

Parallel Index Drives are high-precision, long-lasting and maintenance-free work horses. Continuous operation capabilities and easy synchronization of other mechanical devices make Motion Parallel Indexers a good fit for any application.

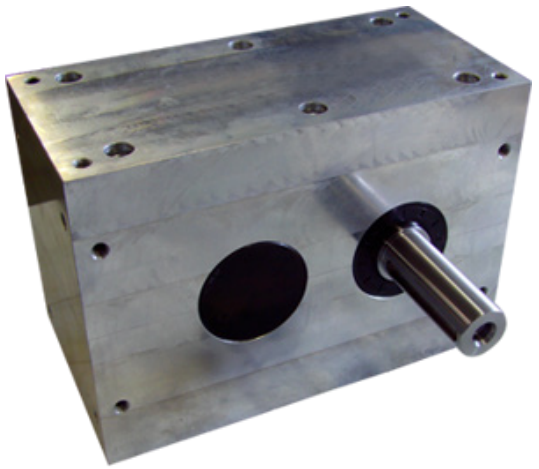
XP & TP Series

XP Series indexers (Parallel Indexers as a whole) provide the most compact indexing drive option available. The parallel shaft configuration is one sought out for several applications. The product line offers high speeds and what may be the most practical shaft design (including the potential for output shafts on both sides of the unit).

Applications for parallel indexers primarily include those pictured in the "General Applications" section on page X (the images use an XP model). Large projects for Motion Index Drives' parallel indexers have included acting as a conveyor drive in an existing batterfy manufacturing system and driving lever arms in a fast-paced packaging process.

The speed of parallel indexers is another primary reason to incorporate them into automation process. With the potential of reaching over 600 cycles per minute and relatively long dwell phases, these indexers are selected for many applications requiring continuous operation. Parallel Indexers often don't have motors mounted directly to their housing. Designers may select a parallel for its unique dimensions and locate a drive unit elsewhere. The indexer can then be driven via a belt or indirect means, and the potential for a double-sided input shaft can allow designers to run other devices continuously from the indexer's input.
Like the TT Series, the TP Series offers alternative sizes and standard aluminum housing.

Check out our Video Reference:
http://motionindexdrives.com/parallel-shaft-index.php



Right Angle Index Drives

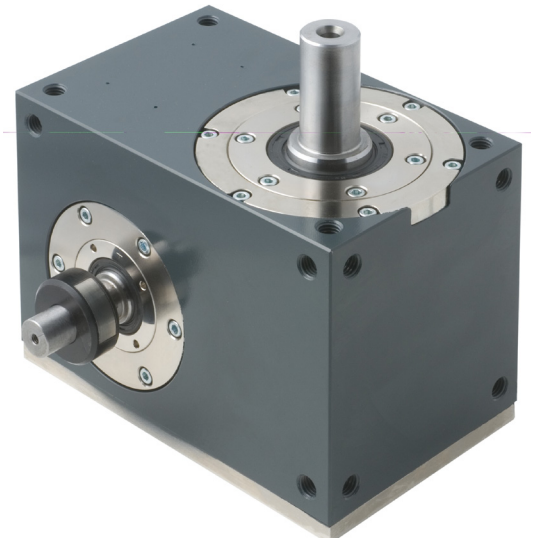
When an application requires speed and consistency in a right angle output, Motion Index Drives' globoidal Right Angle Drives are an ideal solution. These units feature extremely low internal inertia and a compact cam follower design, allowing for up to 1,000 cycles per minute.

The TG Series is Motion Index Drives' right angle drive line that comes standard with steel housing. These units provide a robust solution for applications that require product placement in a particularly demanding environment.

Although the TG Series provides remarkably fast cycle times, the low internal inertia comes at the cost of strength (the star shaft cam follower configuration is to blame for both). As a result, TG Series indexers are more commonly found applications with relatively low load requirements in which the high speed is absolutely necessary.

The TG Series is a key component in the production of many high volume small parts. Production of consumer goods, such as plastics in toys or packaging of cereal, are example lightweight applications. Since indexers also provide signficant accuracy, the TG Series may also be suited for production of semiconductors or other electronic components.

Although the TG Series offers potential speed that makes it clearly stand out from other indexing options, larger models are also available. These models still offer relative speed improvements from barrel or flat cam indexers, but the TG Series is still seen in more convential applications that involve product or tooling positioning with motor off time.

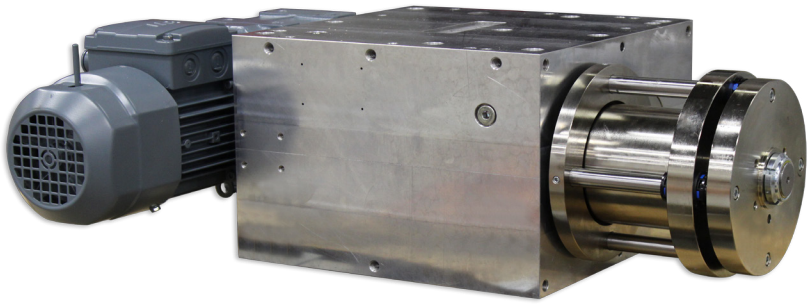


Pick and Place Units

Selecting the right tool for a job can be a daunting task when it comes to product assembly. The variety of Pick & Place and Lift & Rotate Units available from Motion Index Drives can help you lay your options side-by-side. Our cam-driven systems maintain pinpoint precision through countless cycles, and Motion Index Drives' reputation for robust construction ensures a long-lasting solution for your automation processes.

With several Lift & Rotate series to choose from, Motion customers are given the freedom to design an automation process without limitations. Options include single or separate drives for lift and rotate motions; an array of vertical and horizontal stroke lengths; various pendulum angles and free rotation.

As always, Motion's highly experienced engineers are on hand to assist in the unit selection and, if necessesary, customization processes. Most units are maintenance free and their thin, compact profiles allow engineers to work freely with potential tooling configurations.

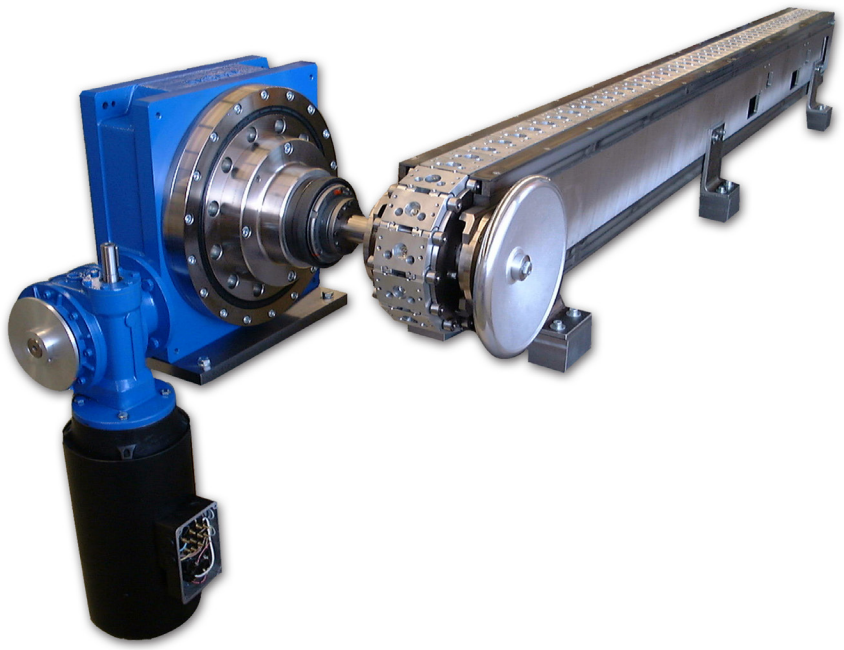


Precision Link Conveyor

The LF Series Precision Link Conveyor is an innovative cam-driven solution for high precision linear transfer applications. Accuracies of ±0.04mm at the drive and ±0.07mm opposite the drive, as well as a capacity of up to 150 cycles per minute, gives our Precision Link Conveyor the ability to perform tasks for industries including medical, electronics, consumer goods and assembly.

Motion Index Drives, Inc. designed the LF Series with versatility in mind. Custom maintenance-free drive options are available, and the conveyor can be utilized in either a vertical or horizontal configuration. High precision aluminum links each have four cam followers which run through a hardened and milled guide rail. In addition, a hard 180° disk cam preloads the chain, resulting in zero backlash. The unique profile of this machined cam results in vibration free transfer, allowing higher production rates than competing precision conveyors.

The Precision Link Conveyor is a highly customizable product. Contact Motion Index Drives to discuss options including custom link dimensions, dwell periods, index angles and special surfaces.



LF Series Conveyor

LF Series applications vary more widely than many think. Although it performs typical precision conveying tasks, such as transportation of solar wafers for assembly; production of precision goods (syringes and the like); or a highly reliable bottling conveyor, the LF Series design is highly flexible.

An LF Conveyor was modified for use in a prototype cardiac imaging unit (C-SPECT - Rush University), and the conveyor's design is highly adaptable for custom link dimensions. Custom stroke length, which is determined by the length of links (aka carriers), and carrier width are easily manufactured.

Although LF Series Conveyors are indexed devices, the conveyor has also received interest as a result of its strength. The high quality aluminum carriers, steel guide rails and body are in use in a plastic wrap production facility. In this application, two LF Conveyors do not index at all, but instead run at synchronized high speeds at a diverging angle to stretch raw plastic material into the final product. Although the application has proven to require more lubrication than an indexed conveyor, the strength of the system has proven suitable for the task.

Reference video:
http://www.youtube.com/watch?v=e0DcoWjJgxI

Ring Index Drives

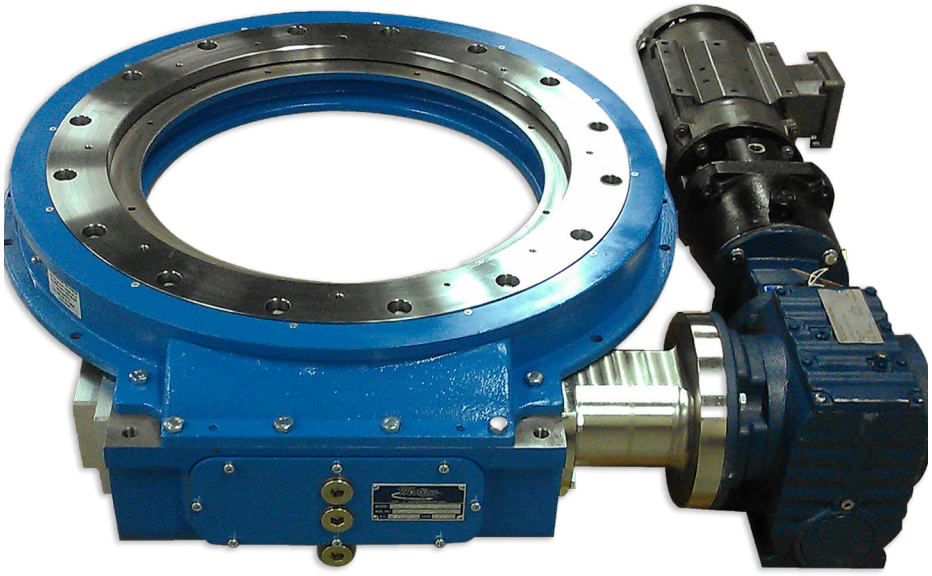
Motion Index Drives' TSR Series of Ring Indexers brings a new, extremely thin profile with a large open central space so that equipment or robots may be centrally mounted to the floor. In addition, mounting additional equipment on the exterior of the Ring Indexer allows for tooling to interface from both sides of the process.

Motion Index Drives's TSR Series brings accuracies of up to ±0.023mm and the same reliability as Motion's rotary tables. Their robust construction and four-point bearing increase service lives and load capacities, making the TSR Series a valuable tool in industrial settings.

As Motion Index Drives' line of ring indexers, the TSR Series fills a very specific role. The large thru-hole and very thin profile offer unique dimensions in comparison to Motion Index Drives' other products. The additional space opens up more options for tooling mounted to the floor in the center. Some applications will also use this space as an opportunity to move a product from the ring to passing tooling or a conveyor below.

Ring indexers offer a unique profile to produce indexed movement. As a result, the TSR Series can be found in any industry in which the design engineer found value in the TSR's shape. Reinforced top bearings give the top dial remarkably consistent strength throughout

Video References:
http://www.youtube.com/watch?v=tDXpYhF2yzk

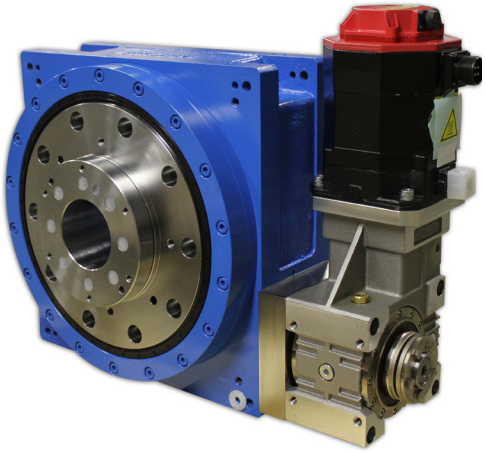


Trunnion Index Drives

Trunnion Indexers are some of the strongest workhorses in industrial automation. Motion Index Drives, Inc. has experience in designing and manufacturing not only the drive unit, but also the tailstock, base weldments and standard or custom tooling frames.

These vertically mounted indexers are capable of rotating extremely large masses with smaller units and also minimize your equipment's footprint on the floor. RT Series Rotary Indexers drive these powerful systems; most RT models are maintenance free and, with the inclusion of an optional Allen Bradley PLC Controller, are also completely wear free.

By mounting tooling on multiple sides of a single frame, your automation processes can benefit by reducing the costs for additional tooling stations and extended transfer systems. Alternatively, mounting a product for assembly gives manufacturers the ability to work on a product at an ergonomic height with free rotation off the ground. Let Motion Index Drives' experienced engineers assist you in sizing a trunnion for your application.



Trunnion Positioners

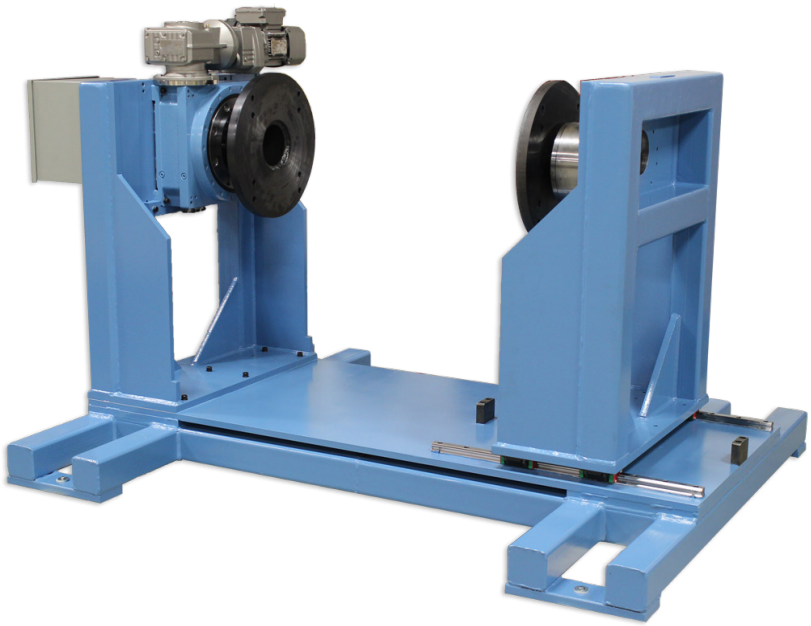
Trunnions are used in a variety of applications ranging in size from the RT100 to some larger than the RT900. With static torque being the most important factor in sizing a Trunnion, applications will almost always be seen with balanced loads.

Trunnion applications, large and small, will typically apply to tooling or part manipulation. Motion Index Drives' Trunnions are used as an assembly tool for Airbus reverse thrusters, where the thruster will be mounted on the Trunnion frame over several days for assembly. A smaller version of the trunnion is used to feed an automotive manufacturing line that assembles two separate vehicles: one side of the trunnion corresponds to one vehicle. RT100 Trunnions can also be found in some EDM machining centers, where they act as a positioning device for the material being machined.

Many customers find Motion's zero backlash systems of particular value. A highly balanced system such as a Trunnion makes it particularly easy to create and detect backlash; with Motion Index Drives' indexers this never becomes an issue.

RT, TT, FLEX, TMF, and TG Series indexers can all be used in trunnion configuration.

Reference Video:
http://www.youtube.com/watch?v=41VoFBb1Nxc



Lift and Carry Systems

Motion Index Drives, Inc. provides some of the most precise and reliable Lift and Carry systems available. Our extensive experience in cam-driven indexing is applied to each system we design, guaranteeing unmatched strength and precision.

Lift and Carry systems from Motion Index Drives operate in an energy efficient manner, requiring minimal motor power even when transferring an average of 10 underbody structures (at 2,000 pounds each) over a distance of 19 feet. Motion has applied its technical expertise to over 55 systems in North America alone.

Motion Index Drives' Lift and Carry systems feature smooth lift and lowering motions driven by our strongest barrel cams. Hydraulic compensation systems to assist lift, hardened gear racks and pinions for transfers, and Motion's signature precision positioning during transfer strokes all make Motion Index Drives a great option for Lift and Carry systems. In addition, the inclusion of Pevolan and Vulkollan transfer rollers reduce noise and extend shuttle rail life span.

These systems are designed to transfer large products down a linear path, usually through various positions for production. Since the products need to be lifted over obstacles or a system by which they could be transferred via the ground would interfere with production, Lift & Carry Systems can be found in the majority of assembly lines working on large items.

Lift & Carry Systems can be applied to high-production facilities that manufacture products large in physical dimensions. Motion Index Drives has worked to integrate Lift & Carry Systems in industries including defense manufacturing (tanks) and off-highway heavy machinery, but current industry systems aren't configured in a fashion that can easily accept a Lift & Carry System.

Reference Video:
http://www.motionindexdrives.com/lift-and-carry.php

Sizing an Indexer

Sizing an indexer can become a very complicated task, but here are three basic items to consider in estimating a size:

1. Swing Diameter: The relationship of the swing diameter to the cam follower pitch diameter is kept to 8:1 or less, never to exceed 10:1. For example, an application of 2000mm can be sized by dividing 2000 by 8 (2000/8=250), sizing the table at an RT250; 1800mm/8=225 (also RT250); 1600/8=200 (RT200). Maximum recommended swing diameter is listed in the catalogue on the first page for each model.

2. Load Inertia: This is potentially the most difficult to determine. To estimate worst case, mulitiply (total load) by (radius^2) by (1,500kg*1.5m2=3375kg*m2; if we were sizing an RT400-4 stop, this would require an index time of 3.82s [see load table on 28 of product catalog]). If possible, substitute the center of gravity radius for application radius ([total load]*[center of gravity radius]^2). Also, Motion's internal TCC calculator can help estimate inertia.

3. Indexing Time: The more index time available, the greater inertia an index table can handle. If an application can be slower, do so, as it will allow for the use of a smaller indexer and be more cost effective (or reduce stress placed on the table).

In exceptional circumstances, a fourth criteria must be considered:

4. Load Weight: If the index time is not a factor, total load weight must be checked to not exceed bearing capabilities. Bearing capabilities can be found in the catalog under each model.

* NOTE: Trunnions consider the above, but the out of balance (static) torque is a new item that must be considered. Static torque is generally the deciding factor in sizing a trunnion. Flexible index drives are stronger than their fixed counterparts, as they always have a minimum of two cam followers engaged in preload (new TMF indexers will have up to five contacting the cam at any time). To size a flexible unit, assume the same size as the fixed for preliminary estimates until final loading can be calculated by engineering.

For parallel and right angle (globoidal) indexers, output torque tends to be the most critical item to determine. Please ask customers for required torque if sizing a parallel, along with the cycle rate. These can help determine a unit quickly.

The above images display the difference in index angle for 2, 6 and 12 stop fixed barrel cams. The 2 stop indexer must rotate the dial plate 180 degrees in a single rotation of the cam, resulting in the very steep angle. The 12 stop must move the output a significantly smaller distance. A table's maximum capacity is significantly affected by this factor, which is clearly reflected in the products' load tables.

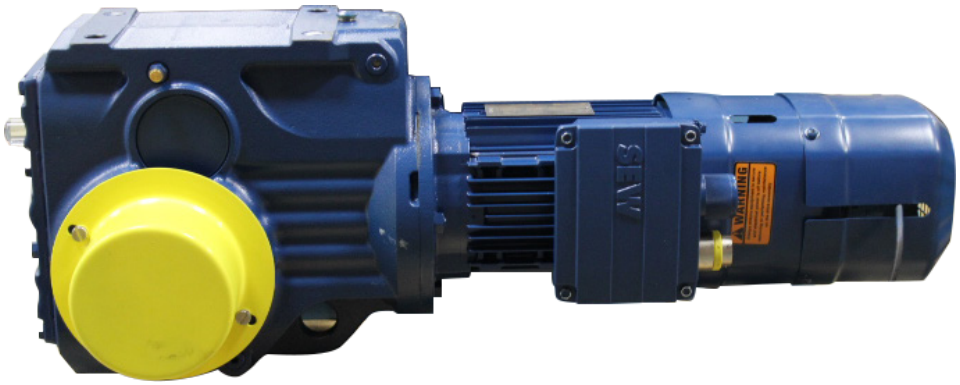
Customizing Indexers

The Motor

Affects: Speed, Torque, Braking, Power Consumption

Options: Single and Two Speed, RPM and Torque values

Description: Key distinctions in motors can be found in two vs. single speed and varying RPM and torque capabilities. Motion manufactures tables with low-friction internal components; it is common for a Motion indexer to require a considerably smaller, more efficient and cost effective motor than leading competitors.



Safety Standards

Affects: How quickly a fully loaded indexer can safely be brought to a full stop, visibility

Options: Motion addresses this issue in table and motor sizing. Other indexer-related safety options include light screens, emergency stop buttons, colors and various others.

Description: Safety standards vary widely from company to company and even more from country to country. Safety is one of the most heavily regulated factors in most industrial processes and many technologies are available to meet these standards. Motion does not provide safety fixtures outside of those directly related to the indexing drive such as light screens or rubber mats. Solutions provided by Motion typically call for motors with enough braking power to bring a fully loaded indexer to a complete stop within a set time, as well as an indexer designed to withstand multiple e-stops without degradation of performance.

The Cam

Affects: Station Count, Indexing Speed, Longevity, Precision, Strength

Options: Barrel, Globoidal, Disc Various Laws of Motion, Physical Dimensions

Description: The heart of an indexer is its cam. It directly drives the dial plate/output shaft via the mechanical interaction between cam and cam followers (fixed to output). The indexer's precision is entirely dependent on the quality of the cam's surfaces; high-precision machining is necessary for the cam's surface(s) to ensure an accurate dwell. The longevity of an indexer is first addressed at the hardening process of the cam and cam followers, which creates wear resistance and resilience to unnatural impacts (such as e-stops). Station count and indexing speed are both determined by the cam's physical qualities.*

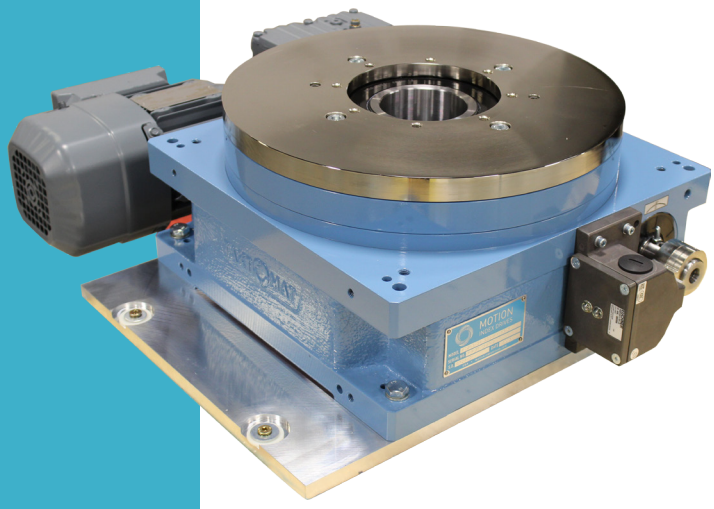
* Note that the Motion Flex line of servo-powered flexible indexers do not have a physically determined dwell, acceleration or deceleration. These constant lead cams are different from those used in fix indexers.

The Dial Plate

Affects: Applicable Tooling Configurations, Precision at Tooling Interface Points

Options: Custom Dimensions, Hole Configurations, Surfaces, Material.

Description: The dial plate (aka indexing head) is the part of the indexer most processes interact with. It is a mounting surface fixed to the indexer's top dial with machined holes at various points for tooling. Whether you are mounting large sets of robotic welding equipment or fine fixtures to hold toothbrushes while bristles are inserted, the dial plate is where it is all attached. Dial plates and structural frames can come in almost any shape and size provided it is physically possible for the table to handle it.



Surfaces/Coatings

Affects: Air Quality (via VOCs and surface exposure), Corrosion Resistance, Visibility, Range of items that can contact surface

Options: Various Colors, Low VOC and Water-Based Paints, Nickel Plating

Description: An indexer's surface impacts several items of concern for safety, environmental and production. Visibility of heavy machinery such as an indexer is of importance for relevant safety standards. Low VOC paints may also be required for certain air quality standards or LEED facilities. Additionally, the surface coating is an indexer's first line of protection against corrosion, which is a common issue – many indexers Motion has serviced have been found in up to a foot of standing water, oils and other various fluids. Nickel plating is the standard solution for many clean room indexer applications because of its reliable resistance to corrosion.

Oil

Affects: Flammability, Longevity, Accuracy

Options: Oils vary as widely as the plant and wildlife Earth has to offer

Description: Motion Index Drives, Inc. recently placed indexers for fire door operation in a facility that handles weapons grade radioactive materials. As you can imagine, the oil placed in the indexer had to be particularly non-flammable and resistant to high radiation levels. Although extremely costly, this oil serves as an example of how widely the chemical properties of oil can vary. More commonly, oils that can be safely exposed in environments that perform food process or medical manufacturing tasks serve as an example of non-standard oils. Motion completely immerses the internal components of its indexers in an oil bath; many models will never require an oil change.

MOTION
INDEX DRIVES

248.743.9999
info@mid.us.com
www.motionindexdrives.com
1204 East Maple Troy MI 48083