

DEITZ ROTARY COMPENSATORS – MODELS 801, 803, 805

WHAT IS IT?

A Rotary Compensator (RC) is a shaft mounted, electro-mechanical control mechanism designed by DEITZ CO., to change the phase or speed relationship between two rotating shafts. The amount of change is determined by the length of time that the RC is energized during a machine cycle, and the internal gear ratio of the RC itself. Depending upon the model, the RC will adjust the output in both an advanced or retarded direction for two-way correction, or in only one direction (but either direction) for one-way correction. The RC benefits from great mechanical advantage over other mechanisms that are used to accomplish shaft timing adjustments due to the unique way that adjustment is accomplished. This technique is explained in detail on another data sheet.

WHERE HAS THE ROTARY COMPENSATOR BEEN USED?

The principal use of Rotary Compensators has been by manufacturers and users of packaging, bag making, collating, sheeting and conveying machinery. Typically the RC has been used to reposition a rotating knife or to overfeed or underfeed the feed roll of continuous motion converting machines using preprinted web. This action is required to keep the printed message within registration tolerances. In other cases the RC can be used to increase or decrease conveyor speed in order to synchronize the arrival of product with machine operation. In most cases the machine requiring compensation is adjusted to feed as close to the desired tolerance as practical and the RC is used to improve upon the accuracy of the feed and to adjust for uncontrollable feed errors.

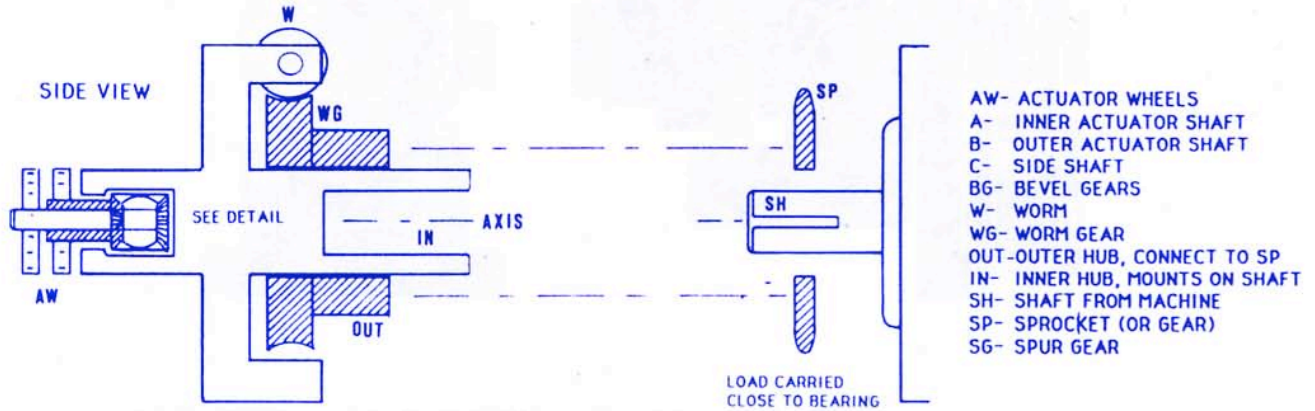
HOW DOES IT WORK?

The RC inner hub mounts directly to a shaft and becomes part of the drive assembly. An outer hub mounts co-axially around the inner hub. The two hubs are coupled by a unique worm-worm gear arrangement and rotate as an assembly on the shaft. This rotation can be described as primary rotation. A gear or sprocket is normally mounted to the outer hub in order to continue the drive path. The outboard end of the RC is supported by a bearing support plate. Between the bearing support plate and the body of the RC is one or two cogged actuator wheels. These wheels are connected by shaft or hub to an internal differential. As the RC rotates so do the actuator wheels and if the wheels are allowed to rotate with the main body, the internal differential does not function. The inner and outer hub turn at exactly the same speed. If an actuator wheel is engaged, it will stop rotating and cause the internal differential, the change gears and the worm-worm gear to turn thereby adding or subtraction motion to the outer hub. In this way the phase or speed relationship between the inner and outer hub changes. We call this altered rotation secondary rotation. Electro-magnetic actuator arm assemblies are attached to the bearing support plate for the purpose of engaging the actuator wheels. Actuator operating time is typically less than 30msec. using our standard 24vdc 100 ohm actuator coil. Other methods of engaging the actuator arm such as by pneumatic solenoid, may be employed.

MAJOR CHARACTERISTICS;

DEITZ Rotary Compensators offer many advantages over other means of compensating rotating motion.

SHAFT MOUNTING- Where space permits, a unit can be installed on an existing shaft possibly replacing an existing gear or sprocket. The same size gear or sprocket can be installed on the RC output hub to retain the original drive link. The load transmitted by the RC is over the shaft as in the original drive, therefore no overhanging load problem is created.



POSITIVE, NO-SLIP DRIVE- The entire load transmitted by the RC is carried by the worm and worm gear alone. This single link minimizes backlash problems. The low lead angle of the high ratio worm and worm gear provides a self-locking link between the input and output hub of the RC.

STATIC DRIVE UNLESS ENERGIZED.- The various gears in the RC are ordinarily motionless relative to each other until the RC is called upon to work

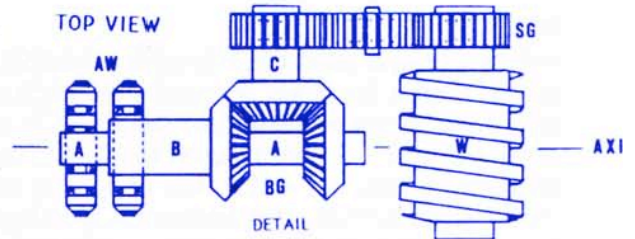
MECHANICAL ADVANTAGE-The 801 and 803 Rotary Compensators are rated to carry 100 in-lbs of load. The 805 is rated at 300 in-lbs. With a 30 to 1 worm gear ratio and neglecting friction loading, about 3 in-lbs is required to turn the worm. Only this greatly reduced load is carried by the smaller differential gearing and the actuator unit.

ACTUATOR UNIT-The mechanical advantage of the rotary compensator design permits the use of a simple, efficient, fast and positive type of actuating device. Very little electrical energy is required to engage the actuator latch.

VARIABLE TIME SHARING- A substantial difference in time exists between the operating time of the actuator and a typical machine operating cycle, ie; 30msec compared to 250msec. By controlling the the operating period of the actuator between these limits, a variable amount of compensation can be introduced in each machine cycle.

ELECTRICAL CHARACTERISTICS- The simple technique of using a coil with the proper impedance as the engaging force for the actuator arm makes it possible to use a broad range of dc voltages. Our standard 100 ohm coil is suited for 24vdc.

DEITZ CO. can supply entire electro-mechanical control systems to operate Rotary Compensators.

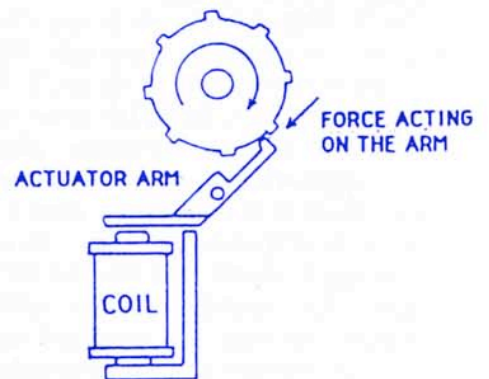


TYPICAL ACTUATOR DESIGN

ENERGIZING THE COIL CREATES A MAGNETIC FIELD WHICH ATTRACTS THE ARMATURE EXTENDING FROM THE ACTUATOR ARM. THE ARM INSTANTLY MOVES INTO THE PATH OF THE COGS ON THE ACTUATOR WHEEL, STOPPING THE ROTATION OF THE WHEEL.

DEENERGIZING THE COIL RELEASES THE ARMATURE. THE ARM MOVES OUT OF THE PATH OF THE COGS, AND THE ACTUATOR WHEEL RESUMES ROTATION IMMEDIATELY.

ACTUATOR WHEEL- HARDENED COGS



ELECTRO-MAGNETIC ACTUATOR
A STATIONARY ASSEMBLY