Correct application of the CF3 INDEX DRIVES is strictly dependent on appropriate selection of all system components and knowledge of the distinctive features of the interior of the drive. This paragraph contains the relevant definitions and some approximate data, which should aid better use of the characteristics of these drives.

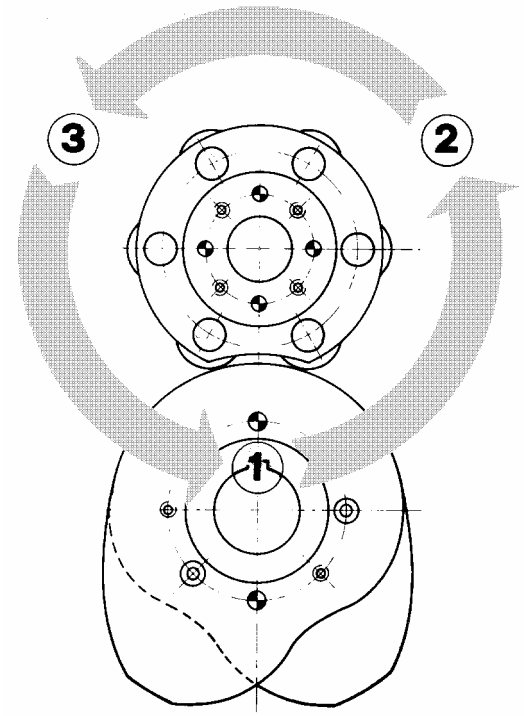
2.1 - NUMBER OF STOPS S

The number of positions, in which the output shaft stops, when making one revolution, is called the NUMBER OF STOPS, and is indicated in the catalogue by the letter S. The extent of the rotation effected by the output shaft during a cycle, corresponding to the transfer from one station to the next, is called ANGULAR STROKE, whose value is expressed by the equation H= 360°/S (degrees).
In applications of the Index Drives for moving dial plates, the number of stations is normally fixed by the number of operations to be performed on the piece being processed, including the loading and unloading positions.
In applications of the Index Drives for driving linear index motion conveyors or roller feeds, the crucial factor is the index or linear distance between the two successive stations. In this application, the correct choice will be the Index Drive, which has the smallest number of S stops, requiring lower torque at the Index Drive output.

2.2 - INDEX PERIOD OR ANGLE B

The complet Index Drive cycle is formed by transfer from one station to the next and a pause (dwell) at each station, and is generally produced in a complete 360° rotation of the input cam shaft.
The INDEXING ANGLE, indicated in the catalogue by the letter B (degrees) is the angle of rotation of the input cam shaft, which moves the output shaft (follower) from one station to the next.
The remaining section of rotation of the input shaft, which keeps the output shaft stationary in the station, is called the DWELL ANGLE. This angle is not shown in the catalogues, but its value can easily be determined from the formula B_P = 360° - B [degrees].
From the standpoint of production speed of automatic machinery, it is advisable to minimise the transfer period and maximise the pause period; at the same time, a longer time is devoted to transfer the motion becomes gentler, and the vibrations due to elasticity and torque due to the inertia required by the mechanism are lower. The inertia torque is, in fact, directly proportional to the square of the number of cycles, and inversely proportional to the square of the INDEXING PERIOD.
The best system is therefore a sensible compromise between the choice of indexing time dwell time. In some cases, following initial approximate definition of the type of drive, it is advisable to re-examine the entire machine cycle in order to determine the maximun indexing angle allowable by exploiting any possibility of superimposing the various movements and minimising down time; for this purpose, we can supply the figures relating to the Index Drive time-indexing diagram on request.

S=3 H=120°



B=210° B_P=150°

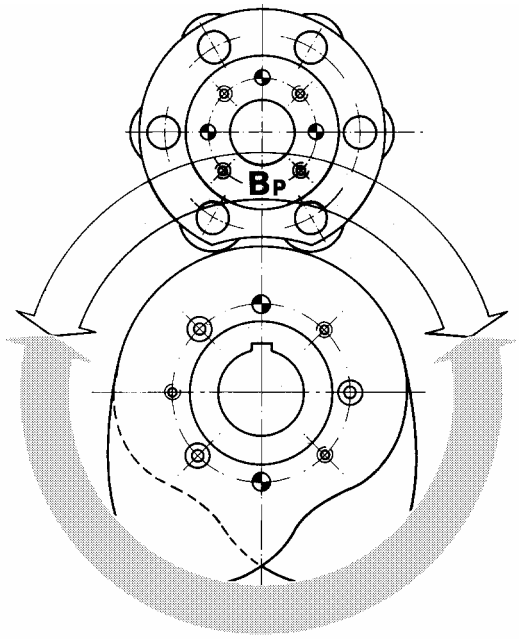


Fig.2 CF...-3-210 INDEX DRIVE

In applications, where the pause times required are very long compared with transfer times, or where the drive is to be operated by an enable mechanism, once the number of stops “S” has been set, the mechanism with the highest INDEXING PERIOD of all the standardised types is selected. A limit switch driven drive splined to the index drive input shaft stops the motor or de-activates a clutch-brake joint on every revolution, by interrupting the power to the motor. The input shaft (leader) is stopped in any position within the pause period. The Index Drive guarantees that the output shaft (follower) remains perfectly stationary in the station.

2.3 - RIGIDITY Is/I

An important factor to be considered in the selection of Index Drive CF3 is the ratio of the station to shaft cetre distances. In order to obtain a good level of rigidity and accuracy, this ratio should not exceed 4/1. The higher the ratio, the lower the rigidity and accuracy of indexing.
For large diameter dial plates, or in cases where the number of S stops requested exceeds the number of standard stops, and where the dwell times are long compared with index times, the most convenient and undoubtedly the most correct system is movement effected by a CF3 Index Drive to a station with gear transmission, whose ratio determines the number of dial stations. The advantages of this system are as follows:

- The Index Drive at a station guarantees perfect indexing repetition.
- The coaxial cogwheel with the dial enables the intermittent transmission to be brought very close to the workstations and thereby gives good rigidity and high indexing accuracy, which will basically depend on the cutting precision of the cogwheel.
- The torque required by the Index Drive will be reduced in proportion to the number of stations on the dial.
- The number of dial stations is unlimited, and may be varied simply by adjusting the ratio between the two gears.
- The only precaution required arises at the design stage, where account is taken of the need to minimise backlash between the transmission gears.

2.4 - TORQUE

In most applications, the factor determining the choice of Index Drive is the torque due to inertia of the internmittent motion parts. In addition, account should be taken of torque caused by friction, work forces, forces due to unbalanced load and any external forces.
Other loads to which the Index Drive is subjected, and which are more difficult to assess, depend on the design and choice of the components of the intermittent motion system, and are caused by backlash in the transmission, torsional elasticity of the mechanical parts etc.
The intermittent motion systems should be stopped and started up only during the dwell period, i.e. in the station. Stopdowns and start-ups effected during the transfer period are highly damaging and may cause breakage of internal parts of the drive.

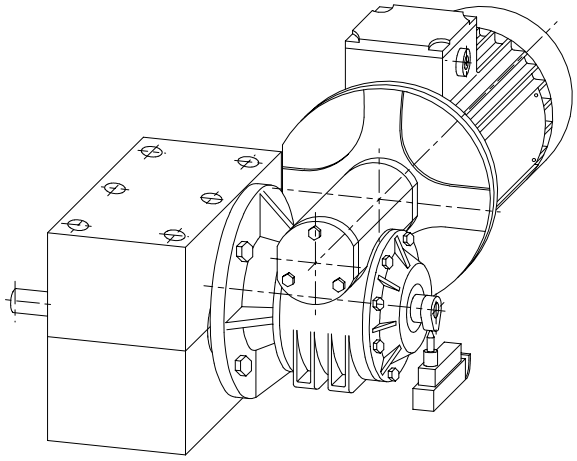


Fig. 3 Layout of limit switch control cam and limit switch.

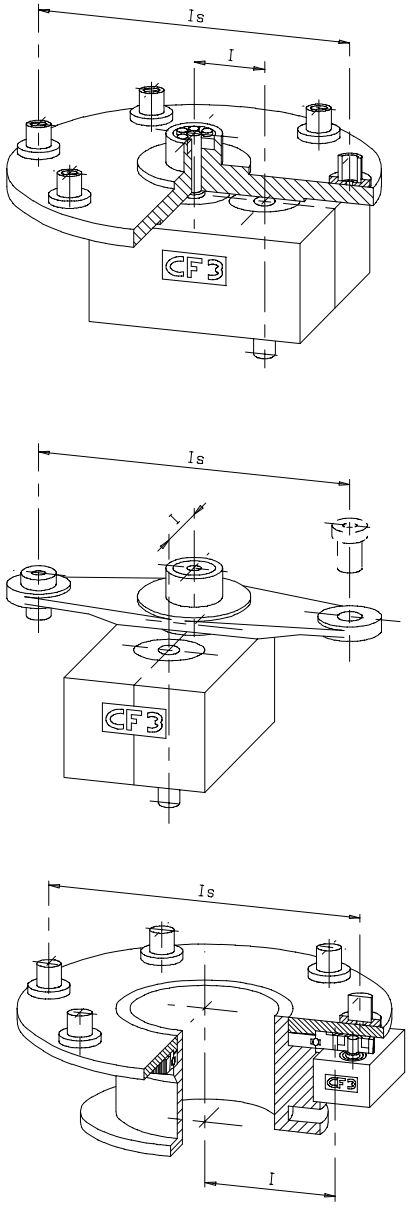


Fig. 4 Centre Distances.