



Motor Type Selection

By design, the Synphase system phases the differential and synchronizes the speed of the various parts of the production line by adjusting the 0-10 volt control interface to the motor controllers. More specifically, one Synphase card controls one commercial electronic motor drive, which in turn controls one motor that is mechanically attached to one mechanism (feeder, gob distributor, etc.).

The Synphase drive can work with any combination of motor/drive package on the market because the only connection between the Synphase controller and the motor drive is a standard 0-10 volt interface. In the past, Synphase has driven S.C.R. controllers with DC motors, inverters with Permanent Magnet Synchronous motors, inverters with 3% slip induction motors (NEMA-B), and inverters with 5-13% slip induction motors (NEMA-D). It is capable of controlling Servo amplifiers with Servomotors.

- **DC Motor:**
When the Synphase system was first developed, the combined price of a DC motor and an SCR controller was significantly less than the equivalent AC induction motor and inverter combination. The advance of electronics in the late 1980s reversed the pricing structure making the AC induction motor the better deal. Combined with the brush wear associated with DC motors, TCD Systems now recommends some form of AC motor be used. The induction motor is the most cost effective and its accuracy is more than adequate for speeds below 550 bottles per minute.
- **Permanent Magnet Synchronous Motor:**
Also known as a Brushless DC Motor is more expensive than an induction motor. It usually has a longer backorder time when replacements are necessary. The higher currents associated with synchronous motors require larger inverters than their induction counterparts. It has been used with Synphase controllers, but offers no advantage in accuracy. In spite of these disadvantages, the synchronous motor does not provide any greater accuracy than a *controlled* induction motor.
- **Induction Motor:**
Induction motors are the workhorses of industry. They are inexpensive, readily available, and familiar. A Synphase controller attached to an induction motor will maintain approximately 1-3 times better accuracy than its uncontrolled P.M. Synchronous counterpart.

In summary, because of the combination of low price and local replacement supply, TCD Systems recommends an inverter driving an induction motor if your IS machine will not exceed 550 bottles per minute.

However, if you are still not convinced, the Synphase system can be supplied with synchronous motors.