

# APPLICATION BULLETIN

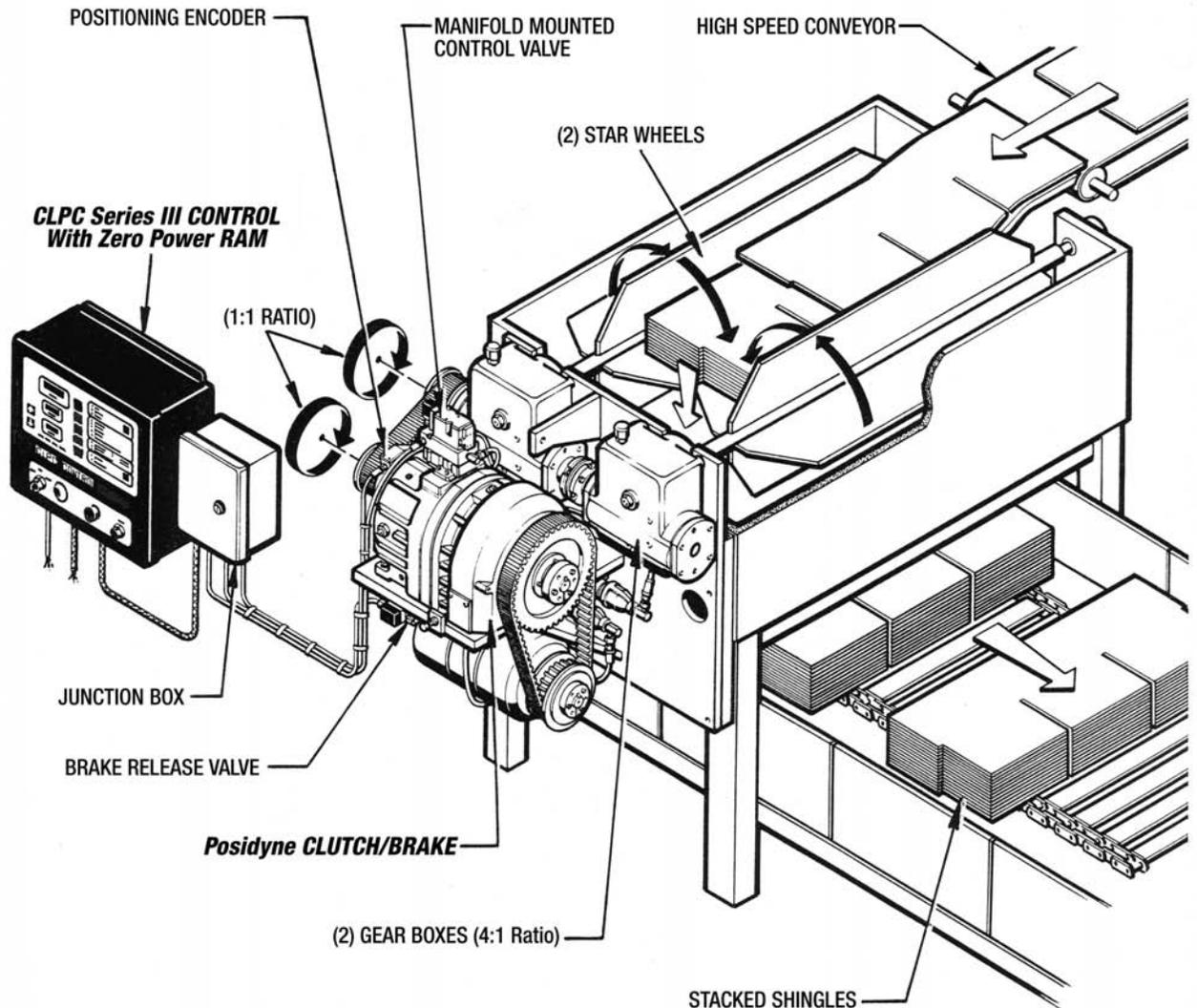


**APPLICATION:** Auto Catcher & Stacker (*Posidyne*)

**INDUSTRY:** Asphalt Roofing Shingle Plants

**PRODUCT:** Oil Shear *Posidyne* Clutch/Brake with CLPC III

## AUTO CATCHER & STACKER (*Posidyne*)



## **AUTO CATCHER & STACKER (*Posidyne*)**

**WHERE THEY ARE USED:** Shingles are manufactured by spreading colored granular material on one side of a wide web of paper or fiberglass saturated with hot asphalt. After the asphalt has cooled, the web is slit into three or four strips. Each strip is then notched and cut to length forming a finished shingle. Shingles are fed into a speed up conveyor to establish spacing between the ends of each shingle. Shingle Catchers, (also called Auto Catchers or Shingle Stackers), are used to catch and stack finished shingles into bundle size groups prepared for wrapping. Three or four catchers are required per line.

**HOW THEY WORK:** Shingle Catchers have two parallel shafts with blades located at 90 degrees along each shaft called "**Star Wheels**". The inside blades of the star wheels are positioned to form a shelf for the finished shingles fed by a high-speed conveyor. When a pre-determined number of singles, usually ranging from three to seven, are caught on the inside horizontal blades, the star wheels are indexed 90 degrees allowing the group of shingles to drop into a collection chamber below. Precise, rapid indexing between the continuously fed shingles is required to prevent jams. The Star Wheels require servo like accuracy to ensure the blade position is maintained. This is easily achievable using a **CLPC III Closed Loop Positioning Control**. The **CLPC III** uses a pulse gear and quadrature encoder, attached to the Clutch/Brake's output shaft, to determine position. The control's software uses a running average algorithm of stopped positions to constantly adjust the brake trigger point to hit absolute position. The result is extremely accurate stopping from a simple, rugged, **Oil Shear** Clutch/Brake. After a full bundle is caught, the collection chamber is opened and the full bundle is dropped onto a conveyor, which takes the shingles to be wrapped.

**PROBLEMS SOLVED:** A *Posidyne* Clutch/Brake with spring-centered piston provides accurate, rapid indexing through a 1:1 timing belt drive to the input shaft of Force Control's new Star Wheel Drive gearbox. The new gearbox has been designed with low inertia 4:1 right angle helical gears, which provide counter rotation of the star wheels. Compression type shaft connections are used throughout. The gearbox design greatly simplifies alignment of components, while reducing total system inertia. Gearing and bearings are lubricated and protected inside the cast iron housing. The manifold mounted, DC pneumatic control valve provides quick actuation required to make the 90 degree index. The custom engineered control with quadrature sensor and predetermining bi-directional counter maintains excellent starting and stopping accuracy. Prototype models can easily hold position within  $\pm 1.5$  degrees.

### **IMPORTANT FEATURES:**

- Low inertia components (multiple disc, Oil Shear Clutch/Brake, timing belt drive, and right angle helical gearbox) attribute to quick and accurate 90 degree indexing of the star wheels.
- Keyless, high torque collet connection to star wheel shafts make alignment and replacement of star wheels quick and easy. High inertia couplings with troublesome keys are eliminated.
- Totally enclosed design of the clutch/brake and gear reducer eliminates problems associated with dust, dirt, and other contaminants.
- **Oil Shear** technology and state-of-the-art friction materials in the *Posidyne* Clutch/Brake provide consistent, accurate indexing.



### **FORCE CONTROL INDUSTRIES, INC.**

3660 Dixie Highway Fairfield, Ohio 45014

Phone: 513-868-0900 Fax: 513-868-2105

E-Mail: [info@forcecontrol.com](mailto:info@forcecontrol.com) Web: [www.forcecontrol.com](http://www.forcecontrol.com)