

E-News November 2007

## “Super-Mod” Clutches and Clutch-Brakes

### Purpose of Power Engaged Clutches:

Clutches are usually located between a motor and the high speed side of a gearbox. The clutch engages the load to the motor shaft rotation when power is applied to the clutch. When power is removed from the clutch, the motor will continue running but the load does not rotate.

### Advantage of using a clutch or clutch-brake:

- A motor accelerates load inertia as well as motor inertia at start up. There is a lag between the time the motor is turned on and the load reaching rated speed. There is also a lag between the time the motor is turned off and the time the load stops rotating, again due to the rotating inertia of the load and motor. A clutch allows the motor to stay at the running RPM while the load changes dynamic speed or stops with application of a brake.
- The inertia of a rotating motor rotor acts as a flywheel and functions as part of the power that accelerates the load.
- Reduce heat built up in the motor windings due to rapid cycling of a motor that results with no clutch in the system.
- Minimize heat build up due to repetitive motor starting currents.
- Reduce wear and tear on the motor key, shaft and bearings.
- The control functions are very simple. A low-power relay can be used to switch the clutch on and off.
- By using the clutch-brake version of the Super-Mod product line, power is removed from the clutch, and applied to the brake. The power applied brake decelerates and holds the load as long as power is applied to the brake coil.

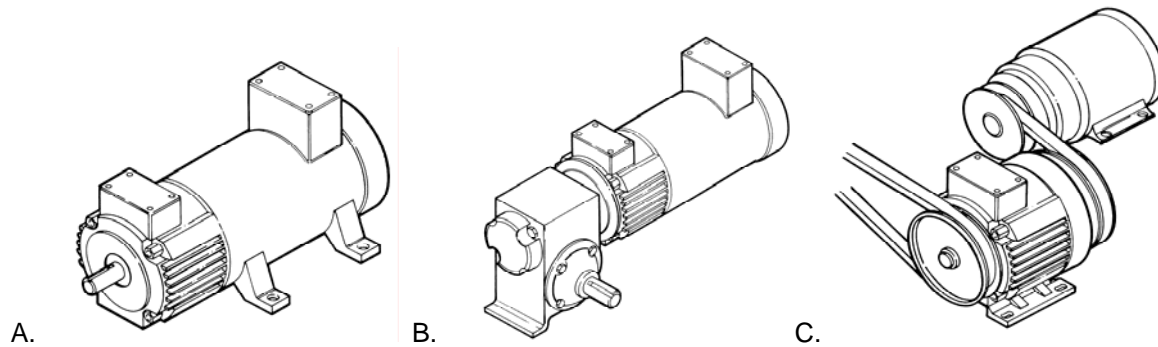
### Super-Mod Options:

The basic super-mod is available as a C-face mount clutch or clutch-brake typically used with 1/2 hp to 10 hp motors. The clutch or clutch-brake can be modified with the addition of a base kit and input adapter kit to make a free standing unit which can be coupled in line, offset, or used with a sprocket or sheave. The conduit box is included with all Super-Mod product.



Pictured: Basic Super-Mod and a Super-Mod with the shaft adapter kit and base kit.

The SM double C-face can be mounted: (A) on the motor drive end for use with a coupling, sheave or sprocket. (B) as a C-face coupling between the motor and gearbox (C) or a free standing clutch or clutch-brake.



### Selection:

Selection is generally made by matching the C-face frame size and shaft size. Confirm the torque is adequate by comparing to the sizing chart provided in the catalog. A sizing factor is used in selection to assure the load will rapidly engage and match the motor speed with minimal slip. The SM is offered as a 12, 24, 48, or 90-103 VDC product, or rectified to 115 or 230 VAC. Cycle rate depends on the inertias and environment. While 20 cycles per minute is normal, higher cycle rates will vary with other factors.

### Rectification:

The super mod is a DC voltage product of a direct acting design. The 90-103 VDC coils can rectify to 115 or 230 VAC by the addition of a small rectifier in the supplied conduit box. One rectifier is used for each coil. A clutch has one coil and uses one rectifier. A clutch-brake has two coils and uses two rectifiers. The compact, solid state, Stearns Torac® rectifier is switched on the AC side.

A separate external rectifier can be selected to power the clutch or clutch side of a clutch-brake at a reduced voltage for softer engagement.



Picture: The Torac® rectifier is placed in the conduit box.

Prior topics have included explanations of: What is a C-face, Solenoid coils, Internal encoders and Identification of unlabeled brakes and parts. Your suggestions and comments are encouraged, your own stories and experiences most welcome.

**Stearns®: Reliable brakes through design, manufacture and support.**