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# **INSTALLATION AND MAINTENANCE**

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## **Installation of PC Clutches**

### **Installation Procedure**

1. The unit comes completely assembled, and there are no gaps to set. The unit must only be mounted in the horizontal position. If the unit is used or handled in a slanted or vertical position, powder distribution and therefore torque will not be consistent. Care should be taken not to apply any type of sharp impact or shock to the unit.
2. Mount the unit to the wall of the machine or support bracket via 6 screws and make sure the unit is locked down solidly.
3. Connections to the input and output shafts should be via a pulley or flexible coupling to avoid overstressing the internal bearings. Couplings should allow for both axial and radial misalignment. Care should be taken not to exceed bearing load limitations.
4. Connect the lead wires to the power source. The clutch torque can be adjusted by varying input current. Torque is approximately linearly proportionate to current for the majority of the unit's torque range.

### **Pre-Running Process**

Particles may become packed unevenly during shipping, so the following pre-running process is recommended to allow for even particle distribution before the unit is run at the full application requirements. This is for initial operation only.

1. Rotate the input shaft at 200~500rpm for a few minutes to distribute the particles. This can be done on the bench or on the machine, but no power should be applied to the coil while this is being done.
2. Initial cycling should be at about 20~40% of full rated voltage. The unit should be cycled 20~40 times at 5 seconds on / 10 seconds off. This will allow the particles to burnish in properly. The clutch field temperature should not exceed 175°F during this process. To further stabilize torque (if desired), run the unit in continuous slip at full voltage at about 30rpm for several minutes.

## **Continuous Slip Operation**

The pre-running process must be completed prior to operation. The unit's exterior housing temperature should not exceed 175°F during operation. Otherwise, it may reduce the unit's life or the unit may become damaged. If additional cooling is necessary, the unit can be mounted to a heat sink or have forced air blown over it. The environment temperature should be kept below 100°F at all times.

## **Maintenance**

1. The magnetic particles must be kept free of moisture. The unit will not be able to perform at its optimal level and clutch torque will become significantly unstable if water or oil is admitted into the unit. The unit should not be stored in an environment with high humidity or condensation. If the unit is mounted near speed reducers or other equipment containing oil, care should be taken not to allow any oil to spill onto or around the clutch. The unit is sealed, but any oil or water placed on the unit may still migrate into the particle chamber.
2. As the magnetic particles wear, their sharp edges will become rounded. This wear will be noticeable as a gradual decrease in clutch torque. This can be compensated for by increasing the input voltage. However, if the voltage needs to be adjusted by more than 30% of the initial setting, the unit may need to be replaced.
3. For forced air applications, a filter system is required to eliminate airborne oil or water particles that may potentially cause internal problems.

## **Heat Dissipation**

Here is a quick reference for determining slip watts for magnetic particle applications (Magnetic particle clutches/brakes are normally limited by heat dissipation rather than by torque when they are involved in a constant slip application).

$$W = .0118 \times T \times \Delta \text{ rpm}$$

W: watts

T: torque [in-lbs]

$\Delta$  rpm: Speed difference between input and output