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# INSTALLATION AND MAINTENANCE

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## Installation of PHT Clutches/Brakes

### Description

PHT permanent hysteresis clutches/brakes transfer torque via magnetic force of permanent magnet, and does not require any wiring for electrical power. Also, it does not have mechanical contact surfaces, which makes it possible to provide stable and accurate torque over a long life.

**S type:** uses combination of permanent magnetic disk, flux blocking disk and hysteresis disk. By changing the orientation of the blocking disk, it adjusts the torque. (This type is used as a brake only.)

**D type:** uses combination of 2 permanent magnetic disks and hysteresis disk. By moving one of the 2 permanent magnetic disks, it can adjust the torque. This can be used either as a clutch or a brake depending on how it's mounted.

### Installation Procedure

1. The unit comes completely assembled, and there are no gaps to set. Care should be taken not to apply any type of sharp impact or shock to the unit.
2. When used as a brake, the mounting surface against the back of the unit should be perpendicular to the shaft within 0.002". The pilot or bolt circle should be concentric to the shaft within 0.008" TIR.
  - a. PHT D type as a brake: The unit is slid onto the customer supplied shaft and then attached to the frame via the 3 tapped holes (see PDF for additional dimensional detail). Once in place, the set screw is tightened down to lock the key from the shaft.
  - b. PHT D type as a clutch: Prior to installing on the shaft, the customer's pulley, gear or flexible coupling is attached to the 3 mounting holes on the face of the unit. (see PDF for additional dimensional detail). Once assembled, the unit is slid onto the customer supplied shaft and the set screw is tightened down locking the unit and the key in place.
  - c. PHT S type: Mount the unit to the wall of the machine or support bracket via 4 screws (S type) or 3 screws (D type) and make sure the unit is locked down solidly. 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.
3. Each unit has an adjustable torque range. To adjust the starting torque of the unit, loosen the single screw on the slot on the body and move the housing to the desired position. The numbers on the unit's body give a reference to each unit's torque range (see PDF for actual torque ranges). Once the desired torque range is set, tighten the screw. Once set the unit will deliver its minimum torque per RPM.

**Maintenance**

1. Permanent hysteresis clutch/brake operates with thin gap between permanent magnetic disk and hysteresis disk. Care should be taken so that excessive force will not make the disks contact each other.
2. If the unit is run at a higher torque setting and then reset to a smaller torque setting while the unit is not rotating, cogging may develop. This would be seen as a rippling effect as the unit rotates. Because the hysteresis disk has some magnetic memory this can occur but can be easily dissipated. To eliminate cogging, simply reset the unit to a higher torque and then rotate the shaft while resetting to a lower torque figure.
3. Permanent hysteresis clutch/brake generates heat in proportion to the product of torque and difference of rotational speed between input and output. The power consumption of the unit (calculated by the formula below) must to be less than the slip energy rating.

$$P=0.0118 \times n \times T_c$$

P: Energy Consumption [W]

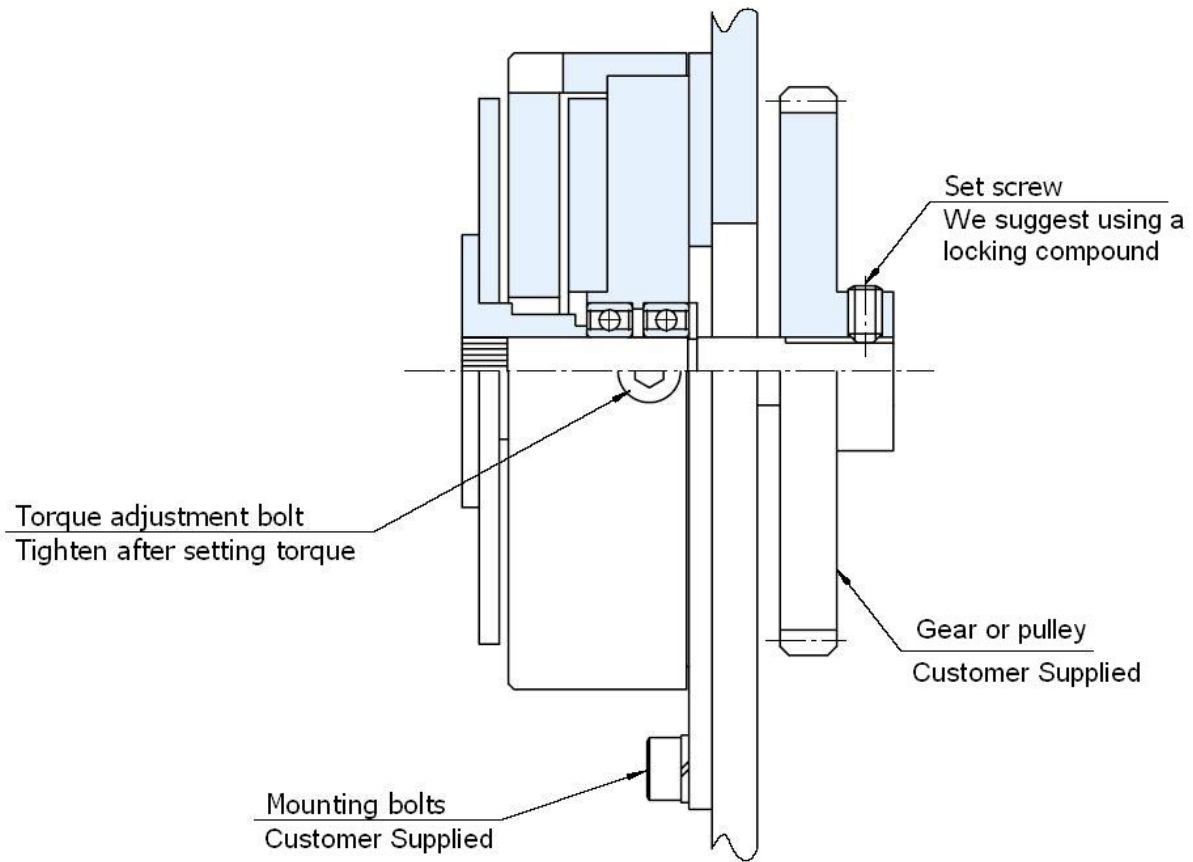
n: Speed differential (rpm)

Tc: Slip Torque [lbs·in]

Model	0.02S	0.05S	0.5S	1.2D	2.5D	5D	10D	30D	70D
Slip Energy Rating [W]	2.5	3	10	15	20	30	45	70	150
	0.02D	0.05D	0.5D						
	1.32	2.65	9.2						

4. The clutch torque can be adjusted with adjustment bolt. When torque is adjusted from high to low, it can create inconsistent rotation speed due to residual magnetism on hysteresis disk. To remove such residual magnetism, move the adjustment bolt from high torque to low torque while turning output axis slowly.

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