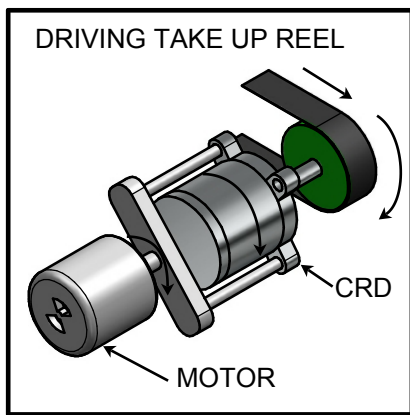


Notes on Constant Tension Take Up Reel



A CR dashpot can be used as a slipping drive between a geared motor and a take up reel for winding tape or wire on to a reel. If sized correctly the tension in the tape can be maintained within reasonable limits for a ratio of maximum to minimum reel radius of up to 2.5. Difficulty sometimes arises because it is necessary to select the correct motor speed as well as dashpot rate.

Suggested Procedure

Given: Tape linear speed **V** m/s
 Required tension **f** N
 Minimum reel radius **a** m
 Maximum reel radius **b** m

Required motor speed **n** = $13 V/a$ rpm

Required damping rate **k** = $\frac{400 f V}{n^2}$ Nm/rad/s

CR dashpot must give torque $\frac{0.4 k V}{a}$

At a speed of 0.4 V/a rad/s.

Check max. Power dissipated = $k(0.1n - V/b)^2 W$

This must be less than 10W for S – CRD and 40W for T – CRD.

SPECIAL DASHPOT QUESTIONNAIRE

When standard dashpots are not suitable, special dampers (metal or plastic) may be offered for high volume applications. To engineer a special unit the following information is required:

- 1 *Continuous rotation or reciprocating (state angle of travel) type.
- 2 *Fixed rate or adjustable rate.
- 3 *Unidirectional or bi-directional damping.
- 4 Maximum operating speed.
- 5 *Maximum operating torque (for strength).
- 6 *Nominal torque and tolerance at specified speed and at 20°C (for damping rate).
- 7 Maximum allowable frictional torque in each direction.
- 8 *Maximum and minimum ambient temperatures.
- 9 *Energy dissipation (watts).
- 10 *Typical cycle description and period between cycles/sequences
- 11 *Maximum acceptable dimensions.
- 12 Mounting arrangement, eg 2 or 4 lugs, clamped body, central or end flange.
- 13 Drive arrangement, eg male or female, square or round with splines or keyway.
- 14 Maximum side load.
- 15 Maximum end load.
- 16 Materials, eg zinc alloy, aluminium or acetal polymer.
- 17 Surface finish, eg natural or painted.
- 18 *Maximum weight.
- 19 Any production test requirements.
- 20 *Volume requirements.
- 21 *Target unit price.
- 22 Storage periods and conditions.

The data marked with an * is essential to initiate any study but all of the above data will be required before a product can be produced.