

## Selecting a Drive

For long, trouble free DISCO operation, make sure to check every item carefully.

### ■ Calculation of required torque (T)

Determine the application torque requirement at the output shaft of the DISCO. If the horsepower requirement at the output shaft is known, the torque can be calculated using the following formula. Check the torque requirement at both the highest and lowest rpm of your application.

$$T = \frac{63,025 \cdot P}{N}$$

Where: T = Transmission Torque (in./lbs.)  
 P = Transmission Power (hp)  
 N = Maximum use speed for constant torque transmission (rpm)

### ■ Determine the service factor (Sf) of the application

The type and frequency of load applied to the output shaft of DISCO combine to provide a required service factor (Sf). Determine the service factor (Sf) from the following table.

#### Service Factor (Sf) Selection

Load Properties	Daily Operating Time		
	Up to 8 hours	8 to 16 hours	16 to 24 hours
Uniform load Continuous operation No reversals Low inertia	1.0	1.1	1.2
Light impact Intermittent operation Reversals <sup>1</sup> Medium inertia	1.3	1.4	1.5
Heavy impact <sup>2</sup> Frequent starts Reversals <sup>1</sup> High inertia	1.7	1.8	2.0

<sup>1</sup> If application requires instant reversals, contact U.S. Tsubaki, PTUC Division.

<sup>2</sup> A mechanical protection device that slips at rated torque may be required.

### ■ Calculate Design Torque (T<sub>d</sub>)

Multiply the required torque (T) by the required service factor (Sf) to obtain the design torque (T<sub>d</sub>).

$$T_d = T \cdot Sf$$

### ■ Preliminary Selection of DISCO

Refer to the "Table of Standard Characteristics," pages D-55~D-56. The selected DISCO should:

1. Be appropriate for the required speed range
2. Have a torque capacity equal to or greater than the design torque (T<sub>d</sub>).  
 DISCO Shaft Torque ≥ T<sub>d</sub>

## ■ Calculation of inertia ratio ( $I_R$ )

Calculate the inertia ratio ( $I_R$ )

$$I_R = I_L/I_M$$

$I_L$  = Inertia of the load at the DISCO output shaft

$I_M$  = Inertia of the motor rotor or input inertia (see chart)

Refer to the "DISCO Input Inertia" chart for inertia guidelines for all DISCO units, including free input types.

DISCO Input Inertia ( $I_M$ )

DISCO	HP	$I_M$ (in <sup>2</sup> ./lbs.)
DK002	1/4	2.68
DK004	1/2	4.05
DK007	1	9.24
DK015	2	15.62
DK022	3	23.18
DK037	5	51.15
DK055	7½	102.30
DK075	10	131.20

## DISCO Inertia Guidelines

Classification	Inertia Ratio ( $I_R$ )	Caution for Selection
Low Inertia	Less than 1	None
Medium Inertia	1 - 4	Start a maximum of one time per hour, or select one size larger DISCO.*
High Inertia	4 - 15	Select one size larger DISCO, and choose a reducer combination that allows the DISCO to run in the higher rpm range.*
Very High Inertia	Above 15	Contact U.S. Tsubaki, PTUC Division

**\*Slow Starting:** Precautions may be necessary to avoid overloading the DISCO. One effective measure is to insert a powder coupling or fluid coupling between the variable speed drive and the load. In addition, start the DISCO at the lowest output rpm.

## ■ Input shaft speed check

Faster input shaft speed yields more efficient operation. The maximum input is 1800 rpm. If the input rpm is low, it may be difficult to change the speed of the DISCO. Please contact U.S. Tsubaki when the input is below 100 rpm.

## ■ Allowable overhung load/allowable thrust load

### 1. Overhung Load

When a sprocket, gear, or pulley is mounted on the high speed or low speed shaft of the DISCO, an overhung load is applied. Refer to the "Table of Standard Characteristics" (pages D55~D56) for the allowable overhung load. The value is given for mounting in the center of the shaft length.

$$\text{Allowable Overhung Load (lbs.)} \geq \frac{T \cdot C_f \cdot L_f}{R}$$

T = Required torque (in./lbs.)

$C_f$  = Load connection factor

$L_f$  = Load location factor

R = Pitch radius of the sprocket, gear, etc. (in.)

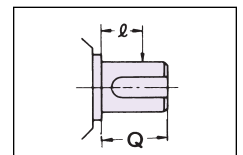
Confirm the overhung load.

### Load Connection Factor ( $C_f$ )

Type of Connection	Factor
Sprocket/Chain	1.00
Gear/Pinion	1.25
Toothed Belt/Pulley	1.50
V-Belt/Pulley	2.00
Flat Belt/Pulley	2.50

### Load Connection Factor ( $L_f$ )

$l/Q$	0.25	0.38	0.50	0.75	1.00
$L_f$	0.8	0.9	1.0	1.5	2.0



### 2. Thrust Load

Refer to the "Table of Standard Characteristics" (pages D-55~D56) of the selected DISCO to confirm that the thrust load is within the design limits. Thrust load is a force acting axially along the shaft.