

## Pin gear drive unit selection formulae—For table drives

Table diameter :	$Dt$ [mm]
Total table weight :	$Mt$ [kg]
Total load weight :	$Mw$ [kg]
Table rotational speed :	$n_2$ [r/min]
Load rotational diameter :	$Dw$ [mm]
Rotational support diameter :	$Ds$ [mm]
Coefficient of friction in rotational support area :	$\mu s$
Acceleration and deceleration time :	$t$ [s]
Table moment of inertia :	$It = \frac{1}{2} \cdot Mt \cdot \left(\frac{Dt}{2000}\right)^2$ [kg · m <sup>2</sup> ]
Load moment of inertia :	$Iw = Mw \cdot \left(\frac{Dw}{2000}\right)^2$ [kg · m <sup>2</sup> ]
Acceleration and deceleration inertia torque :	$Ta = \frac{\pi \cdot (It + Iw) \cdot n_2}{30000 \cdot t}$ [kN · m]
Friction torque :	$Tf = \frac{9.8}{2 \cdot 10^6} \cdot (Mt + Mw) \cdot \mu s \cdot Ds$ [kN · m]
Total load torque :	$Tw = Ta + Tf$ [kN · m]
Tangential load :	$Fw = \frac{2000 \cdot Tw}{Dpw}$ [kN]
Tangential velocity :	$Ve = \frac{\pi}{1000} \cdot Dpw \cdot n_2$ [m/min]
Service factor :	$Ks$ Select from the following table
Speed factor :	$Kv$ Select from the following table
Corrected tangential load :	$Ft = Ks \cdot Kv \cdot Fw$ [kN]
Allowable tangential load :	$Fp$ [kN] Consult the Tsubaki catalog
Pitch :	$P$ [mm]
Pin gear no. of teeth :	$NT_1$
No. of rollers :	$NT_2$
Pin gear pitch diameter (approximation) :	$Da \approx \frac{P \cdot NT_1}{\pi}$ [mm] Consult the Tsubaki catalog for definite values.
Pin wheel pitch diameter :	$Dpw = \frac{P \cdot NT_2}{\pi}$ [mm]
Pin gear rotational speed :	$n_1 = \frac{NT_2}{NT_1} \cdot n_2$ [r/min]
Pin gear load power :	$Pw = \frac{\pi}{30} \cdot Tw \cdot n_2$ [kW]

### Service factor $Ks$

Operation type	Operating time (hrs/day)		
	Less than 3 hours	Less than 12 hours	More than 12 hours
Uniform load	1.00(1.25)	1.15(1.40)	1.25(1.50)
Load with minor impacts	1.25(1.50)	1.40(1.70)	1.60(2.00)
Load with major impacts	1.50(1.80)	1.75(2.15)	2.00(2.50)

Use the values inside the parentheses if the equipment is started/stopped more than 10 times per hour.

### Speed factor $Kv$

Tangential velocity [m/min]	Less than 10	Between 10 and 15	Between 15 and 20	Between 20 and 25	Between 25 and 30	Between 30 and 35	Between 35 and 40	Between 40 and 50	50
Speed factor	1.02	1.04	1.05	1.06	1.06	1.07	1.08	1.1	1.2