Pin gear drive unit selection formulae－Linear drive used

Running angle of inclination: β[°]
Total weight of travel part : M[kg]
Running speed: V[m/min]
Coefficient of bearing friction of wheel : μs
Coefficient of rolling friction of wheel : μr
Acceleration and deceleration time : t[s]
Acceleration and deceleration inertia : $Fa = \frac{M \cdot V}{60000 \cdot t}$[kN]
Load force from friction : $Ff = \frac{9.8}{1000} \cdot M \cdot (\mu s + \mu r \cdot \cos\beta)$[kN]
Load force from gravity : $Fg = \frac{9.8}{1000} \cdot M \cdot \sin\beta$[kN]
Tangential load : $Fw = Fa + Ff + Fg$[kN]
Tangential velocity : $Ve = V$[m/min]
Pin gear load power : $Pw = \frac{Fw \cdot Ve}{60}$[kW]
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 pin rack 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 gear rotational speed : $n_1 = \frac{1000 \cdot Ve}{P \cdot NT_1}$[r/min]
Total pin rack length : $La_2 = P \cdot NT_2$[mm]

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