1.2. Rated Load and Rated Life

Rated Loads in All Directions

The basic load rating in the dimensional table in the "THK General Catalog - Product Specifications," provided separately, indicates the rated load in the radial direction as shown in Fig. 2. The rated loads in the reverse-radial and lateral directions are obtained from table 1 below.

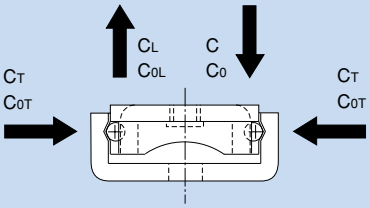

Fig. 2 Directions of the Rated Loads

Table 1 Rated Loads in All Directions

	Basic dynamic load rating	Basic static load rating
Radial direction	C (indicated in dimensional table in "THK General Catalog - Product Specifications,"	C_0(indicated in dimensional table in "THK General Catalog - Product Specifications," provided separately)
Reverse-radial direction	$C_L=C$	$C_{0L}=C_0$
Lateral direction	$C_T=1.47C$	$C_{0T}=1.73C_0$

Static Safety Factor f_s

Model ER may receive an unexpected external force while it is stationary or operative due to the generation of an inertia caused by vibrations and impact or start-up and stop. It is necessary to consider a static safety factor against such a working load.

$$f_s = \frac{f_c \cdot C_0}{P_c}$$

where

f_s : Static safety factor (table 2)
f_c : Contact factor (see table 3 on page E-7)
C_0 : Basic static load rating (N)
P_c : Calculated load (N)

■Reference value of static safety factor

The static safety factors indicated in table 2 are the lower limits of reference values in the respective service conditions.

Table 2 Reference Values of Static Safety Factors (f_s)

Machine using the LM system	Service conditions	Lower limit of f_s
General industrial machinery	Without vibrations or impact	1 to 1.3
	With vibrations or impact	2 to 7

Rated Life

The rated life of Precision Linear Pack model ER is obtained using the following equation.

$$L = \left(\frac{f_C}{f_W} \cdot \frac{C}{P_C} \right)^3 \times 50$$

where

L : Rated life (km)
(The total number of revolutions that 90% of a group of identical ER units independently operating under the same conditions can achieve without showing flaking)
C : Basic dynamic load rating (N)
P_C : Calculated load (N)
f_C : Contact factor (see table 3 on page E-7)
f_W : Load factor (see table 4 on page E-7)

Calculating the Service Life Time

When the rated life (L) has been obtained, if the stroke length and the number of reciprocations per minute are constant, the service life time is obtained using the following equation.

$$L_h = \frac{L \times 10^6}{2 \times \ell_s \times n_1 \times 60}$$

where

L_h : Service life time (h)
ℓ_s : Stroke length (mm)
n_1 : Number of reciprocations per minute (min^{-1})

■f_C : Contact factor

When multiple inner blocks are used in close contact with each other, their linear motion is affected by a moment load and mounting accuracy, making it difficult to achieve uniform load distribution. In such applications, multiply the basic load rating (C) and (C_0) by the corresponding contact factor in table 3.

Table 3 Contact Factor (f_C)

Number of inner blocks in close contact with each other	Contact factor f_C
2	0.81
3	0.72
Normal use1	1

■f_W : Load factor

In general, reciprocating machines tend to involve vibrations or impact during operation. It is difficult to accurately determine vibrations generated during high-speed operation and impact during frequent start-up and stop. Therefore, when the actual load applied on model ER cannot be obtained, or when speed and vibrations have a significant influence, divide the basic dynamic load rating (C), by the corresponding load factor in table 4 of empirically obtained data.

Table 4 Load Factor (f_W)

Vibrations/impact	Speed (V)	f_W
Faint	Very low V≦0.25m/s	1 to 1.2
Weak	Slow 0.25＜V≦1m/s	1.2 to 1.5