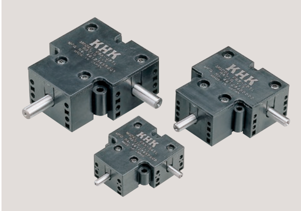
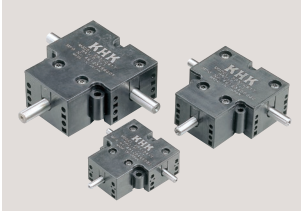
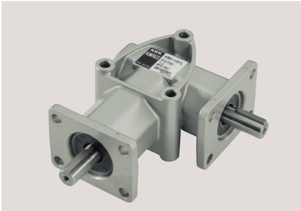
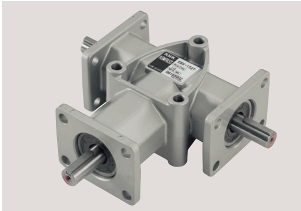
Bevel Gearboxes

■ Selection Guide


KPBX-L Type


KPBX-T Type


KKBX-L Type


KKBX-T Type

Essential data for selection

Load torque, type of prime mover, input speed, speed ratio, running time, coupling method, and frequency of start and stop.

Selection Procedure

The performance table in the catalog is based on the design conditions that the prime mover is a motor, the load is uniform, and the unit runs 10 hours per day.

a) When using the units under any other condition, it is necessary to correct the value of load to torque by applying the service factors shown in Table 1.
Corrected Load Torque = Load torque applied to gearbox x Service factor <See Table 1>.

Service factors (Sf) 〈Table 1〉

Loading condition	Service factors (Sf)		
	Less than 3 hrs/day operation	3–10 hrs/day operation	More than 10 hrs/day operation
Uniform load	1 (1)	1 (1.25)	1.25 (1.50)
Light impact load	1 (1.25)	1.25 (1.50)	1.50 (1.75)
Heavy impact load	1.25 (1.50)	1.50 (1.75)	1.75 (2.00)

(NOTE) 1. Use the factors in parentheses when frequency of starts and stops exceed 10 times per hour.
2. Also, use the factors in parentheses when a prime mover other than a motor is used (for example, an internal combustion engine).

Keep the corrected load torque at the speed at less than the allowed X & Y axis torque (Speed ratio 1:1), or the allowable Y axis torque (Speed ratio 1:2) shown in the performance table.

b) Select an appropriate shaft layout from the shaft layout drawing for each model.

c) Check for overhang load space (O.H.L.)
Overhang load is a load applied beyond the bearing support. Examining the overhang load is indispensable whenever chains, belts, or gears are used to couple the unit with the mating machinery.

$$O.H.L. = \frac{T_{LE} \times K_1 \times K_2}{R} \text{ (N) \{kgf\}}$$

T_{LE} : Corrected load torque applied to the gearbox shaft (N・m) {kgf・m}
R : Pitch radius of sprocket, pulley, gear, etc., mounted on the gearbox shaft (m)
K_1 : Factor depending on the method of coupling <See Table 2>
K_2 : Factor depending on the position of load <See Table 3>
＊ The value of O.H.L. from the equation above must be smaller than the value of allowable O.H.L. on the X-and the Y-axis shown on the performance table.

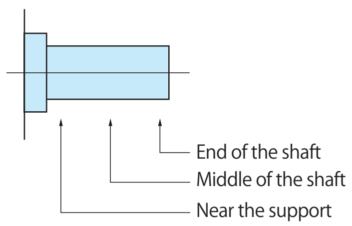
Factor K_1 〈Table 2〉

Coupling method	K_1
Chain, timing belt	1.00
Gear	1.25
V belt	1.50

Factor K_2 〈Table 3〉

Position of load	K_2
Near the support	0.75
Middle of shaft	1.00
End of the shaft	1.50

● Position of load



d) Select a model capable to satisfy all of a), b) and c) obtained above.

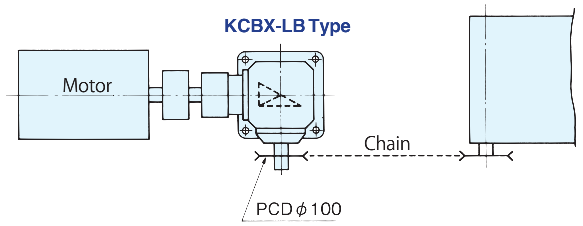
■ Selection Examples


KCBX-L Type


KCBX-T Type

Example 1

Application ／Conveyor (uniform load)
Load torque ／78.4N・m {8kgf・m}
X-axis rotational speed ／300rpm
Speed Ratio ／1：2
Shaft layout ／As illustrated at right
Running time ／12 hours/day
Coupling method ／X-axis — Coupling
Y-axis — Chain (positioned at the middle of the shaft)
Installation ／Horizontal
Location ／Indoors



① **Torque Analysis**
Service factor under load is Sf = 1.25 (Table 1).
Accordingly, corrected load torque applied to Y-axis.
$T_{LE} = 78.4 \times 1.25 = 98N・m$ {$T_{LE} = 8 \times 1.25 = 10kgf・m$}

② **O.H.L. Analysis**
O.H.L.on the Y-axis

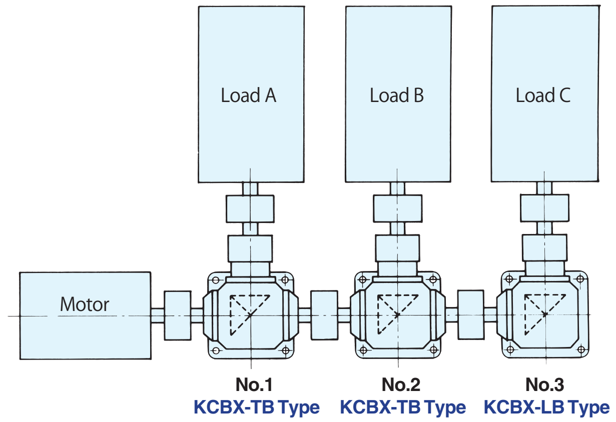
$$O.H.L. = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{98 \times 1 \times 1}{\frac{100}{2 \times 1000}} = 1960N \quad \left\{ O.H.L. = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{10 \times 1 \times 1}{\frac{100}{2 \times 1000}} = 200kgf \right\}$$

③ **Model Selection**
A model capable of satisfying all of the design conditions, torque and O.H.L. is **KCBX-322LB.**

Example 2

Application ／Line shaft drive
Load torque ／58.8N・m {6kgf・m} (uniform load) for each A,B and C
Rotational speed ／600rpm
Speed Ratio ／1：1
Shaft layout ／As illustrated at right
Running time ／8 hours/day
Coupling method ／All couplings
Installation ／Horizontal
Location ／Indoors

In case of an inline shaft drive, load applied to the Y-axis varies with the location of the gearbox. Therefore, an adequate model must be selected individually for each position. Service factor (Table 1) under the design condition is Sf=1.0 for all gearboxes.



① **Gearbox No.1**
Corrected load torque applied to the X-axis that drives only load A is: 58.8 × 1.0 = 58.8N・m {6 × 1.0 = 6kgf・m} Corrected load torque applied to the Y-axis that drives load A, B and C is:(58.8 + 58.8 + 58.8) × 1.0 = 176.4N・m
{(6 + 6 + 6) × 1.0 = 18kgf・m}
KCBX-401TB is selected from the performance table.

② **Gearbox No.2**
Corrected load torque applied to the X-axis that drives only load B is: 58.8 × 1.0 = 58.8N・m {6 × 1.0 = 6kgf・m} Corrected load torque applied to the Y-axis that drives load B and C is:
(58.8 + 58.8) × 1.0 = 117.6N・m
{(6 + 6) × 1.0 = 12kgf・m}
KCBX-321TB is selected from the performance table.

③ **Gearbox No.3**
Corrected load torque applied to the X-axis that drives only load C is: 58.8 × 1.0 = 58.8N・m {6 × 1.0 = 6kgf・m}
Corrected load torque applied to the Y-axis that drives only load C is: 58.8 × 1.0 = 58.8N・m {6 × 1.0 = 6kgf・m}
KCBX-251LB is selected from the performance table.

④ **Model selection**
No.1 gearbox is **KCBX-401TB**
No.2 gearbox is **KCBX-321TB**
No.3 gearbox is **KCBX-251LB**