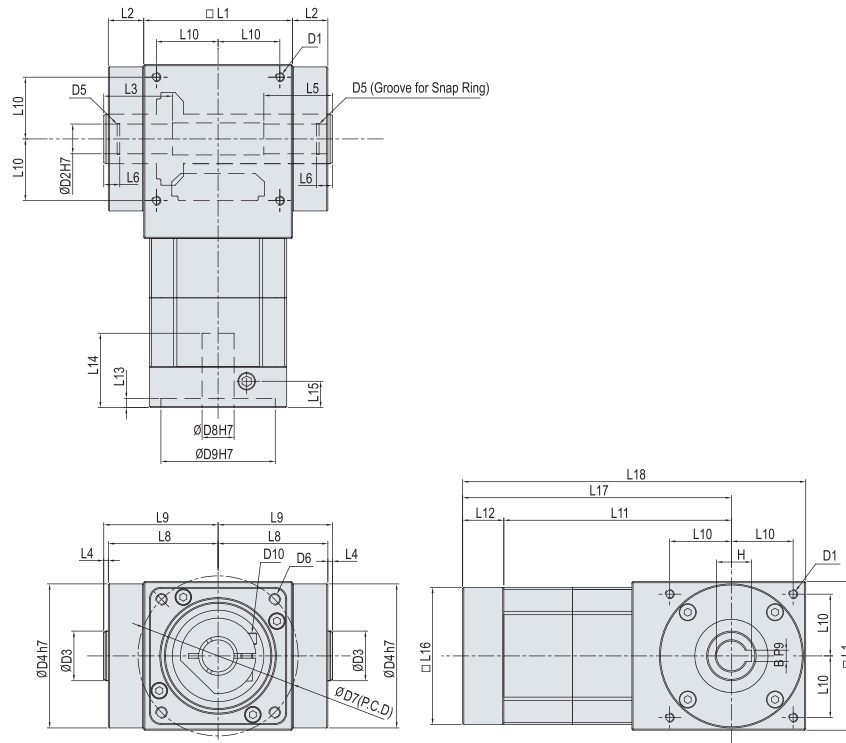


Spiral Bevel Gearboxes

■ Dimensions (SBT 065/090/115/142PH) 2-Stage, Ratio $i = 3 \sim 10$



(Unit : mm)

Dimension \ Model	SBT065PH	SBT090PH	SBT115PH	SBT142PH
D1	M4 DP9	M6 DP12	M8 DP16	M10 DP18
D2 H7	13	18	22	32
D3	21,7	31,8	34,8	49,8
D4 h7	63	88	108	135
D5	1,15 * ϕ 13,6	1,15 * ϕ 19	1,15 * ϕ 23	1,35 * ϕ 33,7
D6	A	M5 DP12	M6 DP12	M8 DP20
	B	M4 DP12	M5 DP12	-
D7	A	70	90	145
	B	70	90	-
D8 H7	14	19	32	38
D9	50	70	110	114,3
D10	M5	M5	M8	M8
L1	65	90	115	142
L2	15,5	16,5	16,5	16,5
L3	30	35	40	50
L4	2	2	2	2
L5	30	35	40	50
L6	7	10	16	22
L8	48	61,5	74	87,5
L9	50	63,5	76	89,5
L10	27	36	44	55
L11	99,5	138	175,5	215,5
L12	18	18	42	42,5
L13	4	4	7	7
L14	32,5	42,5	73	84
L15	11,5	11,5	27,5	33,5
L16	60	90	130	180
L17	77,5	156	217,5	258
L18	150	201	275	329
B P9	5	6	6	10
H	15,3	20,8	24,8	35,3

Note) 1. Specifications are subject to change without notice for improvement.

2. The values of D6 through D9 and L12 through L18 from the above table may vary in accordance with the type of the servo motor.

3. CAD files are available for download from our website at www.spg.co.kr.

How to select bevel gear box

■ Check Points

1	Motor power	() kW or () N · m , Motor specification ()		
2	Rpm	Input shaft (A) : rpm	Output shaft (B-1) : rpm	Output shaft (B-2) : rpm
3	Load torque at output shaft	B-1 () N · m, B-2 () N · m		
4	Velocity ratio	() : 1		
5	Operation time	() Hours / A day (Continuous, Discontinuous)		
6	Type of load	(Uniformed · heavy-weighted impact · light-weighted impact)		
7	Frequency for Normal rotation · Reversed rotation	() Times / A hour		
8	Rotation direction	Input Shaft (CW, CCW), Output Shaft (CW, CCW)		
9	Shaft layout	※ Mark it referring to Catalogue 3 Page		
10	Installation direction	※ Mark detailed description unless it is horizontal mounting		
11	Shaft corrected load torque	Input Shaft side Overhang Load () N		
		Output Shaft side Overhang Load () N		
12	Connection type	Input Shaft (), Output Shaft ()		
13	Installation location and surrounding temperature	(Indoor · Outdoor) (Normal °C / Minimum °C ~ Maximum °C)		
14	Other checking articles	※ Dust, moisture and other liquids around installation locations are indicated.		

■ Procedure for selection

1 Reviewing corrected load torque

◆ Corrected load torque (Te) = Load torque given to bevel gear (Tf) × Service Factor (St) [N · m]

※ Make sure that the corrected load torque for rpm is less than the allowable torque in the specification table in the catalogue (page 7, 12, 17).

(Table1) Service Factor for each load condition

Load conditions	Service Factor (St)		
	Less than 3hr / a day operation	3~10 hr / a day operation	More than 10 hr / a day operation
Uniformed load (In case of one-directional continuous operation)	1 (1)	1 (1.25)	1.25 (1.50)
Light-weighted impact load (In case of frequent normal and reversed operation)	1 (1.25)	1.25 (1.50)	1.50 (1.75)
Heavy-weighted impact load (In case of instant normal and reversed rotation, and instant stop)	1.25 (1.50)	1.50 (1.75)	1.75 (2.00)

(Note) Use the service factors in parentheses when frequency of start/ stop is over 10 times per hour.

How to select bevel gear box

2 Check shaft layout and rotational direction

- ◆ Select the shaft layout of the product series from the applications showed in the catalogue (page 5)

3 Reviewing Overhang Load (O.H.L)

Overhang Load (O.H.L) means the load applied to the middle of the overhang shaft, perpendicular to the axis. It is best to connect the planetary reducer and the machine as a direct connection. If the planetary reducer is connected to the machine by a chain, belt, or gear, then the OHL should be less than allowable for planetary gearhead.

$$O.H.L(N) = \frac{T_e \times K \times L}{R}$$

T_e : Corrected load torque given to output shaft for planetary reducer (Nm)
 [Corrected load torque = load torque given to planetary reducer (Tf) × Service Factor (Sf)]

R : Radius of pitch circle in sprocket, pulley and gear (m)

K : Coefficient depending on connection type (Refer to table 2)

L : Coefficient based on location of load (Refer to table 3)

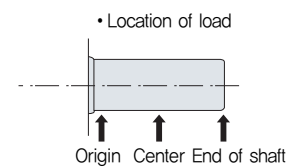
※ Be sure that the O.H.L(N), calculated by the above formula, is less than the allowable O.H.L (N) value by the specification table in the catalogue (page 7, 12, 17).

(Table2)

Connection type	K
Chain, Timing Belt	1.00
Gear	1.25
V-Belt	1.5
Flat-Belt	2.5

(Table3)

Location of load	L
Origin of shaft	0.75
Center of shaft	1
End of shaft	1.5



4 Selection of model

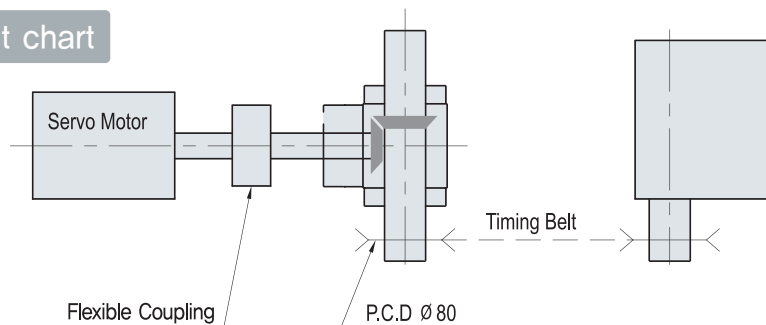
- ◆ Check and select a model from the specification table as shown in the catalogue that satisfies all of the result values at above, 1,2, and 3.

Example of selecting bevel gear box

■ Example 1

1	Applicable area	Conveyor		
2	Motor power	(0.4) kW or (1.27) N·m , Motor specification (Higen, CN04)		
3	Rpm	Input shaft (A) : 1,500 rpm	Output shaft (B-1) : 1,500 rpm	Output shaft (B-2) : 1,500 rpm
4	Load torque at output shaft	B-1 (1.6) N·m, B-2 (0) N·m		
5	Velocity ratio	(1) : 1		
6	Operation time	(12) Hours / A day (Continuous, Discontinuous)		
7	Type of load	(Uniformed · heavy-weighted impact · light-weighted impact)		
8	Frequency for Normal rotation · Reversed rotation	(24) Times / A hour		
9	Rotation direction	Input Shaft (CW, CCW), Output Shaft (CW, CCW)		
10	Shaft layout	T Type		
11	Installation direction	Horizontal mounting		
12	Shaft corrected load torque	Input Shaft side Overhang Load (100) N		
		Output Shaft side Overhang Load (120) N		
13	Connection type	Input Shaft (Flexible Coupling), Output Shaft (Timing Belt)		
14	Installation location and surrounding temperature	(Indoor · Outdoor) (Normal 25 °C / Minimum 5 °C ~ Maximum 35 °C)		
15	Other checking articles	Although there isn't dust and moisture, little oil mist exists.		

◆ Overview for equipment chart



1 Reviewing corrected load torque

- ▶ Service Factor $S_f = 1.5$ (Load type, Operation time, in case that the frequency for normal and reversed rotation is considered)
- ▶ Corrected load torque $T_e = T_f \times S_f = 1.6 \times 1.5 = 2.4 \text{ [Nm]}$

2 Review for Overhang Load (O.H.L)

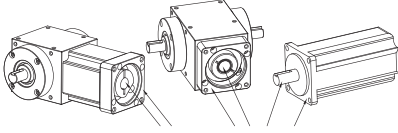
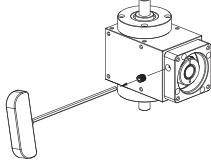
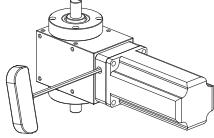
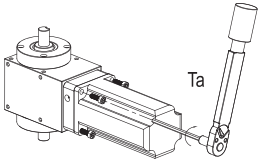
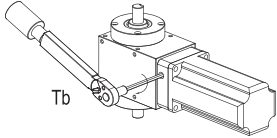
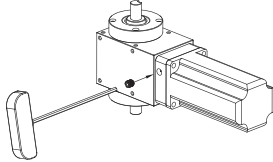
▶ Load O. H. L for output shaft = $\frac{T_e \times K \times L}{R} = \frac{2.4 \times 1 \times 1}{0.4} = 6 \text{ [N]}$

3 Selection of model

- ▶ Select a bevel gear box higher than checking model **SBT042T** that satisfies conditions for use and result values at above 1 and 2 from the specification table (Page 6)

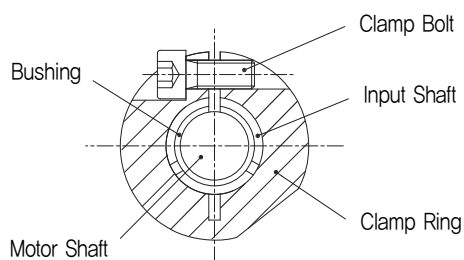
Installation Instructions (In case of M.P Type)

■ Mounting Instructions

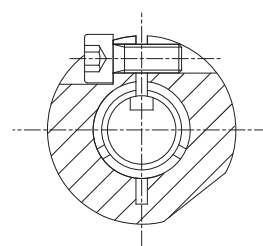
		
<p>1 Brush away and clean out any foreign substances on the surface after verifying the size of the motor and the gearhead. (Check the shaft diameter, use appropriate bushing if necessary)</p>	<p>2 Remove the screw plug from the adapter flange and adjust the position so that the clamp bolt is noticeable. (See "Appendix 1.")</p>	<p>3 When mounting onto the motor, closely adhere the adapter flange of the gearhead and the motor mounting side and slightly tighten the clamping bolt so that the clamp ring not idle.</p>
		
<p>4 Bolts diagonally tighten based on the standard Ta. (See "Appendix 2,")</p>	<p>5 Tighten the clamp ring based on the standard Tb. (See "Appendix 2,")</p>	<p>6 Tighten the screw plug.</p>

■ Appendix 1 How to install motor shaft

If the motor shaft has a key-way, remove the key, and make sure that the key-way of the servo motor shaft and the clamp bolt of the gearhead input shaft is positioned at a right angle with each shaft as shown in Fig. B. Arranging the slots of the clamp ring and bushing with the shaft key-way allows for maximum tightening of the clamp ring cap screw.



(Figure A) Motor shaft without key

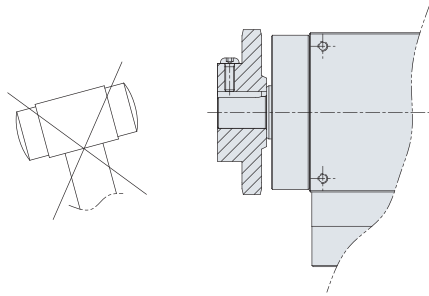


(Figure B) Motor shaft with key

How to connect output shaft

■ Solid Output Shaft Type

- Make sure that the direction of the shaft rotation is correct before a model is connected to the machine to avoid breakage of equipment. A wrong rotational direction may cause injury.
- For models without steps on the shaft, avoid interference when assembling a coupling, sprocket, pulley, or gear to the gearbox shaft. We recommend an H7 for the inner diameter tolerance.
- Do not apply excessive thrust loads to the output shaft when installing couplings, pulleys, gears on the shaft.
- Tapping the shaft with a hammer may cause damage to the inner side of the bearing and the reducer.
- Use proper sized couplings on the shaft to avoid burn or jam.
- When connecting a chain, belt and gear, position the gearbox shaft and the counter shaft horizontally with each other so that an imaginary line connecting both shafts make a right angle with the shaft. (As shown in figure below).
- In case of direct connection, the gearbox shaft and the counter shaft must be aligned accurately to make them in line and fix the key using bolts (or screws). We recommend flexible couplings.



■ Hollow Output Shaft Type

Apply burning prevention agent (MoS₂) to the inner diameter of the driven shaft and insert the key into the driven shaft keyway, and then it into the hollow keyway. Tapping the shaft by hammer may cause damage to the inner side of the bearing and the reducer.

The figures below show how to install a driven shaft to the hollow shaft.

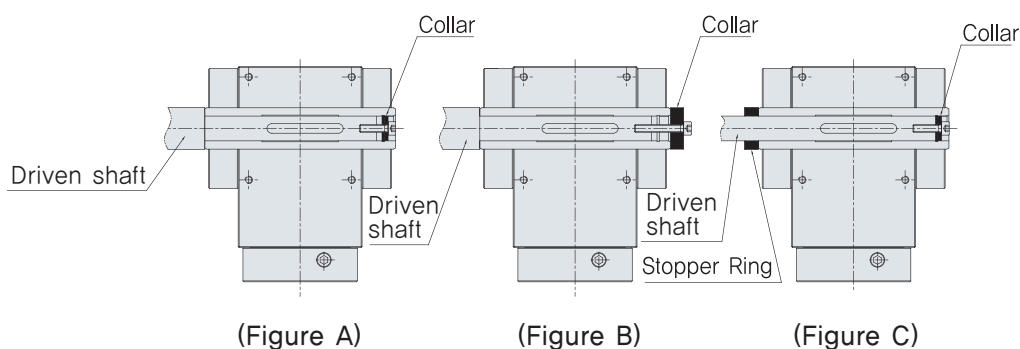
1 In case that a driven shaft has steps

Attach a snap ring onto the hollow shaft, insert the collar and fix the driven shaft with bolts. (Figure A)

Insert the collar using the cross section of the hollow shaft to fix the driven shaft. (Figure B)

2 In case that a driven shaft has no steps

Attach a snap ring onto the hollow shaft and insert the collar onto both ends of the snap ring, and then fix the driven shaft with bolts or using a stopper ring (Figure C)



Cautions For Use

■ Caution

Please ensure to carefully read the precautions indicated below to prevent damage or injury to the user. Failure to read and understand these precautions may result in serious or possibly fatal injury or damage to the product, or to related equipment and systems.

- Avoid hitting the product with a hammer and causing damage from a fall.
- Be cautious when connecting the product to the load side
- Handle the edge and key side of the product carefully
- Keep hands and other foreign substances away from the rotating shaft while the product is in use
- Avoid excessive impact to the product when assembling a pulley, a coupling, a key etc.
- Do not exceed permissible torque as it may cause loosened bolts, shaking, damage, etc.
- Do not disassemble and reassemble the product. In doing so, the original performance may not be guaranteed.
- When sensing an abnormality, stop operation immediately. It may adversely influence the system.

■ Appendix 2 Wrench Bolt tightening torque

Wrench Bolt Size	Motor mounting(8,8T) Ta		Clamp ring(12,9T)Tb	
	N · m	kgf · cm	N · m	kgf · cm
M3	1,28	13	2,15	22
M4	2,9	30	4,95	50
M5	5,75	59	9,7	99
M6	9,9	101	16,5	168
M8	24	245	40	408
M10	48	489	81	826
M12	83	846	140	1,428
M14	132	1,346	220	2,243
M16	200	2,039	340	3,467

■ Warranty

The SPG warranty plan covers the product in the event that it fails to operate properly due to defects in material or workmanship.

Coverage is effective on the purchase date of the SPG product and until the product either reaches 2000 hours worked on time, or 12 months from the date of purchase, whichever comes first.

The products and parts thereof have been used under normal operating conditions or under such conditions specified by the Company, SPG.

If any defects exist during the warranty period, SPG shall repair or exchange the product under this warranty

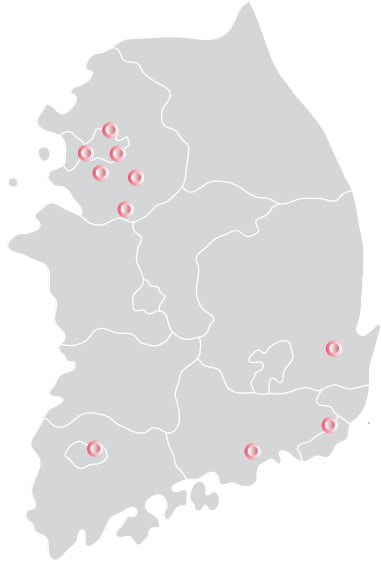
However, this warranty does not cover:

- ① Misuse, including unsuitable handling of the product
- ② Repair done by anyone without the permission of SPG
- ③ Damages not resulting from quality of product itself
- ④ Accident, lightning, and other natural causes that does not come under SPG control

SPG warranty herein means warranty of the product. SPG shall not be liable for consequential or incidental damage arising out of the failure of any product to operate properly.

Sales Network

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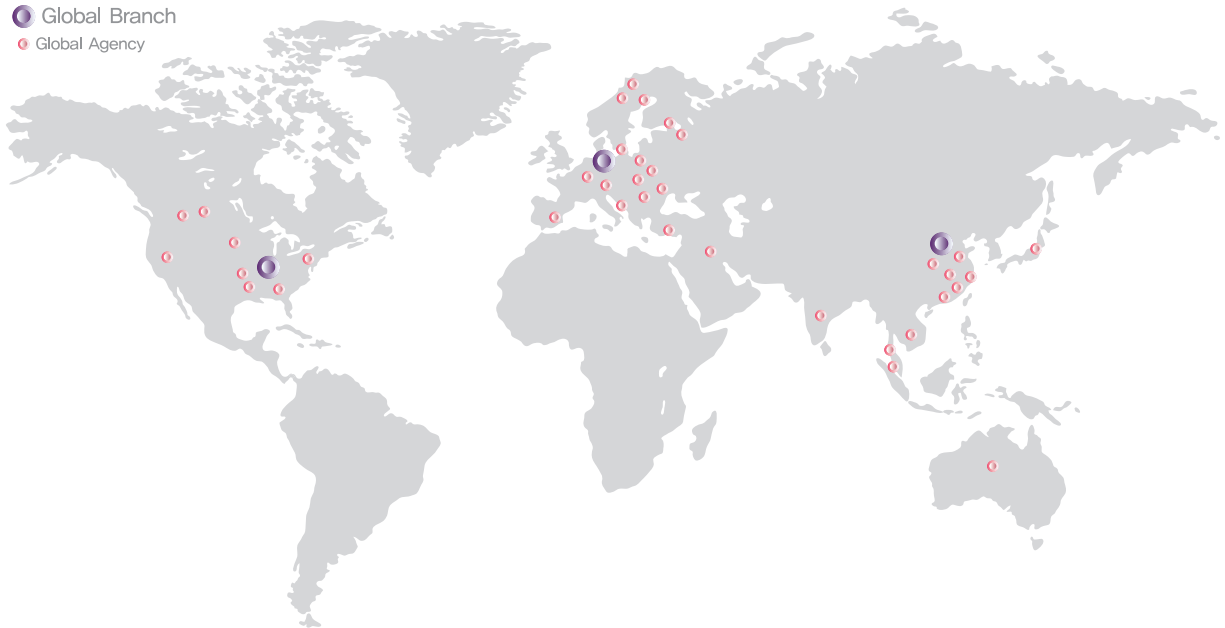


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SPG USA, INC
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EUROPE

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THE NETHERLANDS
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SUZHOU CHINA
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 **SPG Co., Ltd.**
<http://www.spg.co.kr>

■ SPG 67B/L 12LOT 45 , Cheongneung-daero 289 beon-gil, Namdong-gu, Incheon, Korea TEL : 82-32-820-8200 FAX : 82-32-821-0383

■ SALES DIVISION TEL : 82-32-820-8341 FAX : 82-32-812-7094

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