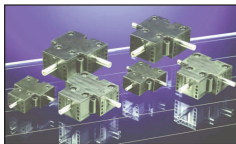


Gearboxes

Miniature Bevel Gearboxes

HPCGBP



Features

- ① Light weight and compact
Simple construction with plastic housing.
Uses a plastic resin which has superior chemical and thermal resistance.
- ② Freedom of installing orientation
Unit has through holes and counter-bores allowing mounting on any orientation.
- ③ Maintenance free
Grease is applied to gears before shipping.
- ④ Speed ratio 1:1

Point to observe during use

1. Environmental conditions

- Ambient Temperature -10°C ~40°C
- Ambient humidity 80% or less
- Atmosphere Well-ventilated, dust-free air not including corrosive gas and steam.
- Location Indoors

2. Mounting Methods

- Bolt or screw the unit firmly on a flat surface free from variations.
- For screws, we recommend JIS Type 2 grooved screws.
- The dimension of the mounting screws and the recommended tightening torques are given in the table below.

Recommended tightening torques

Model	Thru-hole		Tapped screw hole		
	Size	Tightening torque (N.m)	Nominal dia.	Effective length (mm)	Tightening torque (N.m)
HPCGBP-04 Type	M3	0.3~0.6	3	7~11	0.4~0.8
HPCGBP-06 Type	M3	0.4~0.8	3	9~13	0.5~1.0
HPCGBP-08 Type	M4	0.5~1.0	4	9~14	0.5~1.0

- No secondary operations such as adding bolt holes can be performed on the casing. There is a danger that the gearbox will break.
- When used in applications where oil contamination is undesirable such as in food processing machines, please use preventive measures against oil leaks due to malfunction or the units wearing out.

3. Connection with mating machinery

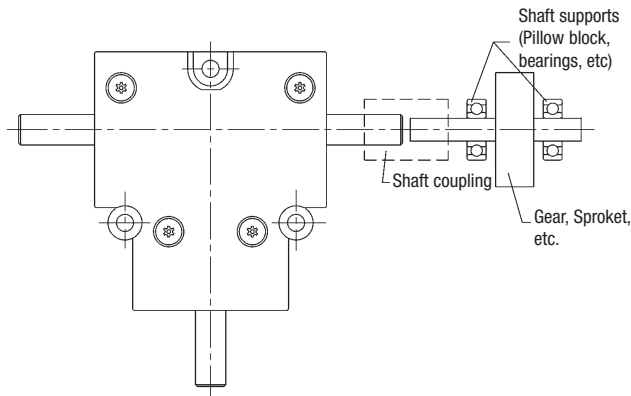
- Before connecting to the mating machinery, please verify the directions of the shaft rotation to avoid breakage of the equipment.
- Please use a flexible coupling to connect the gearbox shaft to a mating shaft.
- Make sure that the shafts of the gearbox and the mating machinery are lined up centre to centre.
- If the gearbox shaft does not have a step, care should be exercised when attaching a coupling so that it does not interfere with the housing.
- There is no keyway on the gearbox shaft. Use clamping type couplings to avoid slippage.

4. Operating precautions

- Do not go near or touch rotating portions of the machine such as the shafts during operation. You may get caught and injure yourself.
- Stop the operation immediately when the noise level or the temperature rises abnormally. Do not restart until all of the causes are analysed and proper repairs are made.
- Do not disassemble or modify these productions. You may destroy the unit.

Selection Hints

- ① HPCGBP series are economical bevel gearboxes. For applications requiring high precision, strength and/or speed, we recommend the use of HPCGBK type bevel gearboxes.
- ② Please avoid overhang and thrust loads on the shafts. By supporting both ends of the shaft on which a gear or sprocket is mounted by means of pillow blocks or bearings as shown below, you can eliminate overhang loads.
- ③ These units are not suitable when you have sudden reversals of rotation or impact loads. Please consider HPCGBK type bevel gearboxes in such applications.



HPCGBP Specification Chart

Type	Specifications	X-axis revolutions per minute (min ⁻¹)						
		50	100	200	250	300	400	500
HPCGBP-041	X&Y-axis torque (N.cm) {kgf.cm}	9.8 {1.0}	9.8 {1.0}	9.6 {0.98}	9.5 {0.97}	9.4 {0.96}	9.3 {0.95}	9.1 {0.93}
HPCGBP-061	X&Y-axis torque (N.cm) {kgf.cm}	39.2 {4.0}	39.2 {4.0}	38.5 {3.93}	38.2 {3.90}	37.9 {3.87}	37.2 {3.80}	36.5 {3.72}
HPCGBP-081	X&Y-axis torque (N.cm) {kgf.cm}	78.4 {8.0}	78.4 {8.0}	77.0 {7.86}	76.5 {7.80}	75.7 {7.72}	74.4 {7.59}	73.1 {7.46}

Caution 1: Be sure not to exceed the allowable values.

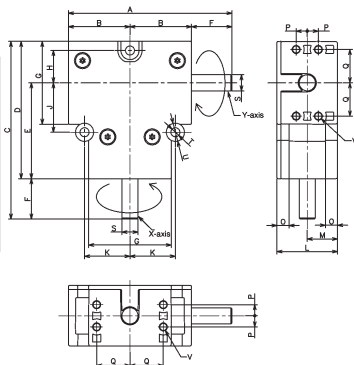
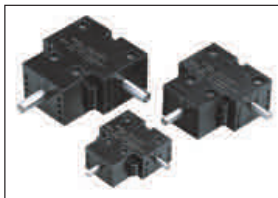
Caution 2: The values in the table are effective when the service factor is 1. When the units are used under other conditions, refer to the Selection Guide.

Gearboxes

Miniature Bevel Gearboxes

HPCGBP

HPCGBP L TYPE

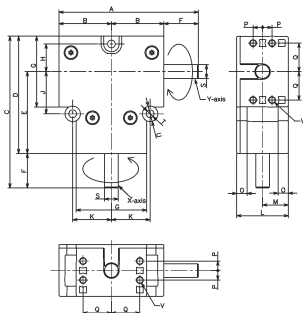
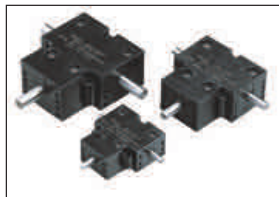


DISCOUNTS		1 - 5		6-19		20-39		40-59		60-99		100+		
		List Price		-5%		-10%		-15%		-20%		-25%		
PART NUMBER	Speed ratio	A	B	C	D	E	F	G	H	J	K	L	M	O
HPCGBP-041L	1:1	51	20.5	55	45	32	10	26	9.5	16	15	18	9	4.5
HPCGBP-061L	1:1	70	27.5	73	58	41	15	34	13.5	20	19	26	13	4.5
HPCGBP-081L	1:1	81	30.5	88	68	47.5	20	41	16	24.5	22.5	30	15	6

PART NUMBER	P	Q	S	T	U	V		Weight (gf)	PRICE EACH
						Diameter	Depth		
HPCGBP-041L	3	10	ø 4	ø 3.5	7	ø 2.5		11	£78.99
HPCGBP-061L	4.5	14	ø 6	ø 3.5	7	ø 2.5		13	£84.94
HPCGBP-081L	5.5	16.5	ø 8	ø 4.5	9	ø 3.3		14	£95.37

- CAUTION 1:** The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.
- CAUTION 2:** In the standard unit, the X-axis rotates clockwise, and the Y-axis counterclockwise.
- CAUTION 3:** The tolerance of shaft diameter is JIS h8.
- CAUTION 4:** The shafts do not have keyways. Please use clamping type couplings to avoid slippage.
- CAUTION 5:** The backlash at the X-axis (input shaft) is about 3.

HPCGBP T TYPE



DISCOUNTS		1 - 5		6-19		20-39		40-59		60-99		100+		
		List Price		-5%		-10%		-15%		-20%		-25%		
PART NUMBER	Speed ratio	A	B	C	D	E	F	G	H	J	K	L	M	O
HPCGBP-041T	1:1	61	20.5	55	45	32	10	26	9.5	16	15	18	9	4.5
HPCGBP-061T	1:1	85	27.5	73	58	41	15	34	13.5	20	19	26	13	4.5
HPCGBP-081T	1:1	101	30.5	88	68	47.5	20	41	16	24.5	22.5	30	15	6

PART NUMBER	P	Q	S	T	U	V		Weight (gf)	PRICE EACH
						Diameter	Depth		
HPCGBP-041T	3	10	ø 4	ø 3.5	7	ø 2.5	11	45	£78.99
HPCGBP-061T	4.5	14	ø 6	ø 3.5	7	ø 2.5	13	120	£84.94
HPCGBP-081T	5.5	16.5	ø 8	ø 4.5	9	ø 3.3	14	200	£95.37

- CAUTION 1:** The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.
- CAUTION 2:** In the standard unit, the X-axis rotates clockwise, and the Y-axis counterclockwise.
- CAUTION 3:** The tolerance of shaft diameter is JIS h8.
- CAUTION 4:** The shafts do not have keyways. Please use clamping type couplings to avoid slippage.
- CAUTION 5:** The backlash at the X-axis (input shaft) is about 3.

Selection Guide



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 catalogue 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 conditions, 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.

NOTE 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.

$$\text{O.H.L.} = \frac{\text{TLE} \times K1 \times K2}{R} \quad (\text{N}) \quad \{\text{kgf}\}$$

TLE: 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)

K1: Factor depending on the method of coupling (See Table -2)

K2: 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.

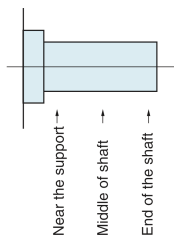
Factor K1 (Table 2)

Coupling method	K1
Chain, timing belt	1.00
Gear	1.25
V belt	1.50

Factor K2 (Table 3)

Position of load	K2
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.

Gearboxes

Spiral Bevel Gearboxes

Selection Examples

Selection Examples

Example 1

Application: Conveyor (uniform load)

Load torque: 78.4 N.m [8 kgf.m]

X-axis rotational speed: 300 min⁻¹

Speed ratio: 1:2

Shaft layout: As illustrated below

Running time: 12 hours/day

Coupling method: X-axis--Coupling

Y-axis--Chain (positioned at the middle of the shaft)

Installation: Horizontal

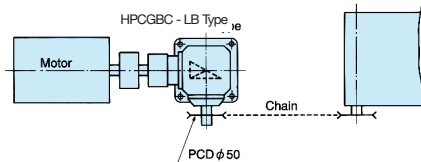
Location: Indoors



HPCGBC-L Type



HPCGBC-T Type



1 Torque Analysis

Service factor under load is $S_f=1.25$ (Table 1).

Accordingly, corrected load torque applied to Y-axis.

$TLE=78.4 \times 1.25=98 \text{ N.m}$ { $TLE=8 \times 1.25=10 \text{ kgf.m}$ }

2 O.H.L Analysis

O.H.L on the Y-axis

$$\text{O.H.L} = \frac{TLE \times K_1 \times K_2}{R} = \frac{98 \times 1 \times 1}{100} = 1960 \text{ N}$$

$$\{ \text{O.H.L} = \frac{TLE \times K_1 \times K_2}{R} = \frac{10 \times 1 \times 1}{100} = 200 \text{ kgf} \}$$

3 Model Selection

A model capable of satisfying all of the design conditions, torque and O.H.L. is HPCGBC-322LB.

Example 2

Application: Line shaft drive

Load torque: 58.8 N.m [6 kgf.m] (uniform load) (for each A, B, and C)

Rotational speed: 600 min⁻¹

Speed ratio: 1:1

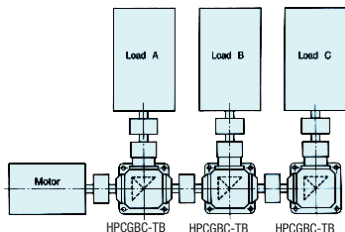
Shaft layout: As illustrated at right

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 $S_f=1.0$ for all gearboxes.

① Gearbox No.1

Corrected load torque applied to the X-axis that drives only load A is:

$$58.8 \times 1.0 = 58.8 \text{ N.m} \quad \{6 \times 1.0 = 6 \text{ kgf.m}\}$$

Corrected load torque applied to the Y-axis that drives load A, B and C is:

$$(58.8 + 58.8 + 58.8) \times 1.0 = 176.4 \text{ N.m}$$

$$\{(6 + 6 + 6) \times 1.0 = 18 \text{ kgf.m}\}$$

HPCGBC-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:

$$58.8 \times 1.0 = 58.8 \text{ N.m} \quad \{6 \times 1.0 = 6 \text{ kgf.m}\}$$

Corrected load torque applied to the Y-axis that drives load B and C is:

$$(58.8 + 58.8) \times 1.0 = 117.6 \text{ N.m}$$

$$\{(6 + 6) \times 1.0 = 12 \text{ kgf.m}\}$$

HPCGBC-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:

$$58.8 \times 1.0 = 58.8 \text{ N.m} \quad \{6 \times 1.0 = 6 \text{ kgf.m}\}$$

Corrected load torque applied to the Y-axis that drives only load C is:

$$58.8 \times 1.0 = 58.8 \text{ N.m} \quad \{6 \times 1.0 = 6 \text{ kgf.m}\}$$

HPCGBC-251LB is selected from the performance table.

④ Model selection

No.1 gearbox is **HPCGBC-401TB**

No.2 gearbox is **HPCGBC-321TB**

No.3 gearbox is **HPCGBC-251TB**

Gearboxes

Spiral Bevel Gearboxes

HPCGBK


Features

- ① Compactness
Simplicity of design, enclosed in an aluminum die-cast casing.
- ② Low noise and high efficiency
The spiral bevel gears are made of case-hardened alloy steel.
- ③ Freedom of installing orientation
The unit can be installed easily in any orientation.
- ④ Maintenance-free
High-grade grease is sealed in the casting before shipping.
- ⑤ Selective speed ratio
Gear ratios of 1/1 or 1/2 are available to meet most applications.

Lubrication

A standard volume of lubricant is sealed at the factory before shipping.

Model	Volume of lubricant	Lubrication	
HPCGBK10 Type	10g	Grease	The grease contains the Li Extreme Pressure additive NLG-00
HPCGBK15 Type	30g		
HPCGBK20 Type	50g		

Point to observe during use

1. Environmental space suitable for installation

- ① Ambient Temperature -10°C ~40°C
- ② Ambient humidity 80% or less
- ③ Atmosphere
Well-ventilated, dust-free air not including corrosive gas and steam.
- ④ Location

Indoor

2. Mounting methods

- ① Bolt the unit firmly on a machined plain surface free from vibrations.

- ② No secondary operations such as adding bolt holes can be performed on the casing. Also, do not disassemble or modify the units. There is a danger that the gearbox will break.
- ③ When used in applications where oil contamination is undesirable such as in a food processing machines, please use preventive measures against oil leaks due to malfunction or the units wearing out.

3. Connections with mating machinery

- ① Before connecting to the mating machinery, please verify the direction of the shaft rotation to avoid breakage of the equipment.
- ② Take care not to cause interference with an oil seal or case surface when fitting a coupling, sprocket, pulley, gear, etc. to gearbox shafts, especially for models without steps on the shaft. We recommend an H7 tolerance for the bore.
- ③ In the case of direct connection, alignment must be made accurately so that the gearbox shaft and the mating shaft are inline. We recommend flexible couplings.
- ④ When using a chain, belt or gear drive, position the gearbox shaft and the mating shaft accurately parallel with each other so that a line connecting the centre of one shaft to the centre of the other shaft makes a right angle with the shafts.

4. Operating precautions

- ① Do not get near or touch rotating portions of the machine such as the shafts during operations. You may get caught and injure yourself.
- ② Stop the operation immediately when the noise level or the temperature rises abnormally. Do not restart until all of the causes are analysed and proper repairs are made.
- ③ Sudden reversal of the direction of rotation could affect the gearbox and mating machinery. Be sure to stop the unit before reversing the rotation.
- ④ Be sure to keep the load torque and overhang load (O.H.L.) within the allowable range during operation.

HPCGBK Performance Chart

Speed ratio	Type	Specifications	X-axis revolutions per minute (min ⁻¹)														Allowable thrust load (N) (kgf)	
			50	100	200	300	400	600	900	1200	1500	1800	2500	3600	X-axis	Y-axis		
1:1	HPC GBK-101	Allowable Power (kW)	0.01	0.02	0.05	0.07	0.09	0.14	0.20	0.26	0.31	0.35	0.38	0.44	59 (6)	69 (7)		
		X&Y-axis torque (N.m)(kgf.m)	2.35 (0.24)	2.35 (0.24)	2.25 (0.23)	2.25 (0.23)	2.16 (0.22)	2.16 (0.22)	2.06 (0.21)	2.06 (0.21)	1.96 (0.20)	1.86 (0.19)	1.47 (0.15)	1.18 (0.12)				
		X-axis O.H.L. (N) (kgf)	78 (8)	78 (8)	78 (8)	78 (8)	69 (7)	69 (7)	69 (7)	69 (7)	69 (7)	59 (5)	49 (5)	39 (4)				
		Y-axis O.H.L. (N) (kgf)	127 (13)	127 (13)	118 (12)	118 (12)	118 (12)	108 (11)	108 (11)	108 (11)	98 (10)	98 (10)	78 (8)	59 (6)				
		Allowable Power (kW)	0.05	0.09	0.18	0.27	0.35	0.51	0.75	0.96	1.16	1.30	1.44	1.66				
	HPC GBK-151	X&Y-axis torque (N.m)(kgf.m)	8.82 (0.90)	8.82 (0.90)	8.62 (0.88)	8.53 (0.87)	8.33 (0.85)	8.13 (0.83)	7.94 (0.81)	7.64 (0.78)	7.35 (0.75)	6.86 (0.70)	5.49 (0.56)	4.41 (0.45)	98 (10)	118 (12)		
		X-axis O.H.L. (N) (kgf)	255 (26)	255 (26)	255 (26)	245 (25)	245 (25)	235 (23)	225 (23)	216 (22)	216 (22)	186 (19)	157 (16)	127 (13)				
		Y-axis O.H.L. (N) (kgf)	294 (30)	294 (30)	284 (29)	284 (29)	274 (28)	265 (27)	265 (27)	255 (26)	245 (25)	216 (22)	176 (18)	147 (15)				
		Allowable Power (kW)	0.09	0.18	0.36	0.52	0.68	0.95	1.38	1.78	2.15	2.50	2.55	2.95				
		X&Y-axis torque (N.m)(kgf.m)	17.6 (1.80)	17.6 (1.80)	17.2 (1.75)	16.7 (1.70)	16.2 (1.65)	15.2 (1.55)	14.7 (1.50)	14.2 (1.45)	13.7 (1.40)	13.2 (1.35)	9.80 (1.00)	7.84 (0.80)				
	HPC GBK-201	X-axis O.H.L. (N) (kgf)	353 (36)	353 (36)	343 (35)	333 (34)	333 (34)	323 (33)	314 (32)	304 (31)	294 (30)	265 (27)	216 (22)	176 (18)	196 (20)	274 (28)		
		Y-axis O.H.L. (N) (kgf)	529 (54)	529 (54)	519 (53)	510 (52)	500 (51)	490 (50)	470 (48)	451 (46)	431 (45)	392 (40)	324 (32)	255 (26)				
		Allowable Power (kW)	0.005	0.01	0.02	0.03	0.04	0.06	0.09	0.12	0.14	0.16	0.17	0.20				
		X&Y-axis torque (N.m)(kgf.m)	2.06 (0.21)	2.06 (0.21)	2.06 (0.21)	1.96 (0.20)	1.96 (0.20)	1.86 (0.19)	1.86 (0.19)	1.76 (0.18)	1.67 (0.17)	1.27 (0.13)	1.08 (0.11)	0.88 (0.09)				
		X-axis O.H.L. (N) (kgf)	88 (9)	88 (9)	88 (9)	88 (9)	88 (9)	78 (8)	78 (8)	78 (8)	78 (8)	69 (7)	59 (6)	49 (5)				
1:2	HPC GBK-102	Y-axis O.H.L. (N) (kgf)	137 (14)	137 (14)	127 (13)	127 (13)	127 (13)	127 (13)	118 (12)	118 (12)	118 (11)	108 (11)	88 (9)	69 (7)	59 (6)	69 (7)		
		Allowable Power (kW)	0.02	0.04	0.08	0.13	0.17	0.25	0.36	0.46	0.55	0.62	0.69	0.80				
		X&Y-axis torque (N.m)(kgf.m)	8.43 (0.86)	8.43 (0.86)	8.23 (0.84)	8.13 (0.83)	8.04 (0.82)	7.84 (0.80)	7.55 (0.77)	7.25 (0.74)	7.06 (0.72)	6.57 (0.67)	5.29 (0.54)	4.21 (0.43)				
		X-axis O.H.L. (N) (kgf)	255 (26)	255 (26)	255 (26)	245 (25)	245 (25)	235 (24)	225 (23)	216 (22)	216 (22)	186 (19)	157 (16)	127 (13)				
		Y-axis O.H.L. (N) (kgf)	294 (30)	294 (30)	284 (29)	284 (29)	274 (28)	265 (27)	265 (27)	255 (26)	245 (25)	216 (22)	176 (18)	147 (15)				
	HPC GBK-152	Allowable Power (kW)	0.05	0.10	0.19	0.28	0.37	0.53	0.77	0.99	1.15	1.31	1.40	1.57	98 (10)	118 (12)		
		X&Y-axis torque (N.m)(kgf.m)	19.6 (2.00)	19.6 (2.00)	18.6 (1.90)	18.1 (1.85)	17.6 (1.80)	17.0 (1.73)	16.4 (1.67)	15.7 (1.60)	14.7 (1.50)	13.9 (1.42)	10.8 (1.10)	8.33 (0.85)				
		X-axis O.H.L. (N) (kgf)	372 (38)	372 (38)	363 (37)	363 (37)	353 (36)	343 (35)	333 (34)	323 (33)	314 (32)	274 (28)	235 (24)	186 (19)				
		Y-axis O.H.L. (N) (kgf)	588 (60)	588 (60)	578 (59)	568 (58)	559 (57)	539 (55)	529 (54)	510 (52)	490 (50)	441 (45)	363 (37)	294 (30)				
		Allowable Power (kW)	0.05	0.10	0.19	0.28	0.37	0.53	0.77	0.99	1.15	1.31	1.40	1.57				
	HPC GBK-202	X&Y-axis torque (N.m)(kgf.m)	19.6 (2.00)	19.6 (2.00)	18.6 (1.90)	18.1 (1.85)	17.6 (1.80)	17.0 (1.73)	16.4 (1.67)	15.7 (1.60)	14.7 (1.50)	13.9 (1.42)	10.8 (1.10)	8.33 (0.85)	196 (20)	274 (28)		
		X-axis O.H.L. (N) (kgf)	372 (38)	372 (38)	363 (37)	363 (37)	353 (36)	343 (35)	333 (34)	323 (33)	314 (32)	274 (28)	235 (24)	186 (19)				
		Y-axis O.H.L. (N) (kgf)	588 (60)	588 (60)	578 (59)	568 (58)	559 (57)	539 (55)	529 (54)	510 (52)	490 (50)	441 (45)	363 (37)	294 (30)				
		Allowable Power (kW)	0.05	0.10	0.19	0.28	0.37	0.53	0.77	0.99	1.15	1.31	1.40	1.57				
		X&Y-axis torque (N.m)(kgf.m)	19.6 (2.00)	19.6 (2.00)	18.6 (1.90)	18.1 (1.85)	17.6 (1.80)	17.0 (1.73)	16.4 (1.67)	15.7 (1.60)	14.7 (1.50)	13.9 (1.42)	10.8 (1.10)	8.33 (0.85)				

Caution 1: Be sure not to exceed the allowable values. Units with (1:2) reduction ratio have the slower speed in the Y-axis.

Caution 2: The values in the table are in effect when the service factor is 1. When the units are used under other conditions, refer to the Selection Guides.

Caution 3: Overhang load (O.H.L.) means the load applied to the middle of the overhang shaft, perpendicular to the axis. When using the units under other conditions, refer to the factors K1 and K2 described in the Selection Guide.

Caution 4: When the 1:2 speed ratio is used as a speed increaser (from the Y-axis to the X-axis), the X-axis torque becomes one half of the Y-axis torque shown in the table.

Caution 5: The Y-axis torque of type T is the sum of the values on both right and left axis.

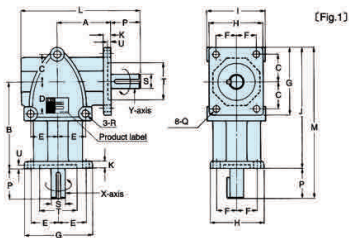
Caution 6: The Y-axis O.H.L. of type T is the sum of the values on both right and left axis.

Gearboxes

Spiral Bevel Gearboxes

HPCGBK

HPCGBK L TYPE



DISCOUNTS

	1 - 5	6-19	20-39	40-59	60-99	100+
List Price		-5%	-10%	-15%	-20%	-25%

PART NUMBER	Speed ratio	A	B	C	D	E	F	G	H	I	J	K	L	M	P
HPCGBK-101L	1:1	37	58	18	18	18	14	46	38	40	82	5	82	102	20
HPCGBK-102L	1:2														
HPCGBK-151L	1:1	66	100	31	36	31	22	80	62	66	140	8	137	170	30
HPCGBK-152L	1:2														
HPCGBK-201L	1:1	80	120	36	36	36	26	92	72	76	166	10	168	206	40
HPCGBK-202L	1:2														

PART NUMBER	Q	R	S	T	U	Key NOTE 1	Backlash of shaft rotation NOTE 2	Weight (kgf)	PRICE EACH
HPCGBK-101L	ø 5.5	ø 6.5	ø 10	ø 26 _{H7}	2	1 x 15 ϕ (flat)	16' ~ 44'	0.4	£159.46
HPCGBK-102L							30' ~ 1° 23'		£159.46
HPCGBK-151L	ø 8.5	ø 8.5	ø 15	ø 42 _{H7}	3	5 x 5 x 27 ϕ	10' ~ 37'	1.8	£340.83
HPCGBK-152L							19' ~ 1° 09'		£340.83
HPCGBK-201L	ø 8.5	ø 8.5	ø 20	ø 52 _{H7}	4	6 x 6 x 35 ϕ	8' ~ 33'	3.1	£462.01
HPCGBK-202L							15' ~ 60'		£462.01

NOTE 1 : The key dimensions are per JIS B 1301-1976 (Standard grade).

NOTE 2 : The backlash angles are measured at the X-axis (input shaft).

CAUTION 1: The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.

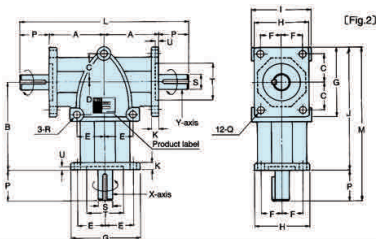
CAUTION 2: In the standard unit, the X-axis rotates clockwise, and the Y-axis counterclockwise.

CAUTION 3: The key grooves in the X-axis and the Y-axis do not always coincide in phase with each other.

CAUTION 4: The tolerance of shaft diameter is JIS h7.

CAUTION 5: The pinion gear is mounted on the X-axis (the input side) in 1:2 ratio units.

HPCGBK T TYPE



DISCOUNTS

1 - 5	6-19	20-39	40-59	60-99	100+
List Price	-5%	-10%	-15%	-20%	-25%

PART NUMBER	Speed ratio	A	B	C	D	E	F	G	H	I	J	K	L	M	P
HPCGBK-101T	1:1	37	58	18	18	18	14	46	38	40	82	5	114	102	20
HPCGBK-102T	1:2	37	58	18	18	18	14	46	38	40	82	5	114	102	20
HPCGBK-151T	1:1	66	100	31	36	31	22	80	62	66	140	8	192	170	30
HPCGBK-152T	1:2	66	100	31	36	31	22	80	62	66	140	8	192	170	30
HPCGBK-201T	1:1	80	120	36	36	36	26	92	72	76	166	10	240	206	40
HPCGBK-202T	1:2	80	120	36	36	36	26	92	72	76	166	10	240	206	40

PART NUMBER	Q	R	S	T	U	Key NOTE 1	Backlash of shaft rotation NOTE 2	Weight (kgf)	PRICE EACH
HPCGBK-101T	ø 5.5	ø 6.5	ø 10	ø 26H7	2	1 x 15 (flat)	16' ~ 44'	0.5	£172.88
HPCGBK-102T	ø 5.5	ø 6.5	ø 10	ø 26H7	2	1 x 15 (flat)	30' ~ 1° 23'	0.5	£172.88
HPCGBK-151T	ø 8.5	ø 8.5	ø 15	ø 42H7	3	5 x 5 x 27	10' ~ 37'	2.2	£373.57
HPCGBK-152T	ø 8.5	ø 8.5	ø 15	ø 42H7	3	5 x 5 x 27	19' ~ 1° 09'	2.2	£373.57
HPCGBK-201T	ø 8.5	ø 8.5	ø 20	ø 52H7	4	6 x 6 x 35	8' ~ 33'	3.4	£487.35
HPCGBK-202T	ø 8.5	ø 8.5	ø 20	ø 52H7	4	6 x 6 x 35	15' ~ 60'	3.4	£487.35

NOTE 1 : The key dimensions are per JIS B 1301-1976 (Standard grade).

NOTE 2 : The backlash angles are measured at the X-axis (input shaft).

CAUTION 1: The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.

CAUTION 2: The right and left shafts on the Y-axis rotate in the same direction as shown in the illustration.

CAUTION 3: The key grooves in the X-axis and the Y-axis do not always coincide in phase with each other.

CAUTION 4: The tolerance of shaft diameter is JIS h7.

CAUTION 5: The pinion gear is mounted on the X-axis (the input side) in 1:2 ratio units.

Gearboxes

Spiral Bevel Gearboxes

HPCGBC


Shaft Orientations and Orientation Codes

There are 24 permutations of shaft orientations and rotations, which are standardised for HPCGBC Bevel Gearboxes. Please pay attention to the shaft orientations in addition to the part number when selecting the units.

Caution 1: The diagrams below show the mounting surface.

Caution 2: The arrow marks on the shafts are intended to show the relative directions of rotation. The units can be driven in the opposite directions as well.

Caution 3: “▼” mark indications the surface on which the oiling and drain plugs are located when mounting horizontally. The ones without the marks have the plugs on the rear surface (Standard specifications).

Caution 4: When the unit (other than LI~LL Type, TE~TF Type) is used with the input shaft (X-axis) pointing up and is wall mounted, the lubrication method for the bearings must be altered. Please notify us at the time of the placing your order.

Caution 5: For use other than mounting surface, please see page 1.112.

Features

① Very strong

The unit has high grade cast iron housing and uses tapered roller bearings.

② Low noise and high efficiency

The spiral bevel gears are made of case-hardened alloy steel.

③ Freedom of installing orientation

The unit can be installed easily in any orientation. However, if you cannot use one of the standard orientations, please see page 1.112.

④ Maintenance-free

High-grade oil is added to the casing before shipping.

⑤ Selective speed ratio

Gear ratios of 1/1 or 1/2 are available to meet most applications.

Lubrication

























A standard volume of lubricant is sealed at the factory before shipping.

Model	Volume of lubricant	Lubrication	
HPCGBC-19 Type	0.3L	Oil	JIS Gear oil Industrial Type 2
HPCGBC-25 Type	0.7L		
HPCGBC-32 Type	1.0L		
HPCGBC-40 Type	1.5L		

Operating preconditions

See HPCGBK (page 1.100)

HPCGBC Shaft Orientations Chart

	HPCGBC-L Type Diagram				HPCGBC-T Type Diagram	
Horizontal Type (Top View)	 A Type	 B Type	 C Type	 D Type	 A Type	 B Type
	 E Type	 F Type	 G Type	 H Type	 C Type	 D Type
Vertical Type (Front View)	 I Type	 J Type	 K Type	 L Type	 E Type	 F Type
	 M Type	 N Type	 O Type	 P Type	 G Type	 H Type

HPCGBC Performance Chart Notes

- Caution 1:** Be sure not to exceed the allowable torque values. Units with (1:2) reduction ratio have the slower speed in the Y-axis.
- Caution 2:** The values in the table are in effect when the service factor is 1. When the units are used under other conditions, refer to the Service Factor Tables 2 and 3 (page 1.97).
- Caution 3:** Overhang load (O.H.L.) means the load applied to the middle of the overhang shaft, perpendicular to the axis. When using the units under other conditions, refer to the factors K1 and K2 described in Tables 2 and 3 (page 1.97).
- Caution 4:** When the 1:2 speed ratio unit is used as a speed increaser (from the Y-axis to the X-axis), the X-axis torque becomes one half of the Y-axis torque shown in the table.
- Caution 5:** The Y-axis torque of HPCGBC-T Type is the sum of the the values on both right and left axis.
- Caution 6:** The Y-axis O.H.L. of HPCGBC-T Type is the sum of the the values on both right and left axis.
- Caution 7:** The allowable thrust load is half of O.H.L. value in each case.

Gearboxes

Spiral Bevel Gearboxes

HPCGBC
HPCGBC Performance Chart

Speed ratio	Type	Specifications	X-axis revolutions per minute (min ⁻¹)												
			20	50	100	200	300	400	600	900	1200	1500	1800	2500	3600
1:1	HPCGBC -191	Allowable Power (kW)	0.08	0.20	0.39	0.77	1.15	1.50	2.05	2.67	3.30	3.95	4.40	4.40	4.40
		X&Y-axis torque (N.m)(kgf.m)	37.2 {3.8}	37.2 {3.8}	37.2 {3.8}	36.3 {3.7}	36.3 {3.7}	36.3 {3.6}	32.3 {3.3}	28.4 {2.9}	26.5 {2.7}	24.5 {2.5}	23.5 {2.4}	16.7 {1.7}	10.8 {1.1}
		X-axis O.H.L. (N) (kgf)	1760 {180}	1760 {180}	1760 {180}	1760 {180}	1670 {170}	1620 {165}	1270 {130}	1080 {110}	882 {90}	833 {85}	784 {80}	686 {70}	637 {65}
		Y-axis O.H.L. (N) (kgf)	1960 {200}	1960 {200}	1960 {200}	1960 {200}	1960 {200}	1810 {185}	1470 {150}	1180 {120}	1030 {105}	980 {100}	931 {95}	784 {80}	735 {75}
	HPCGBC -251	Allowable Power (kW)	0.25	0.62	1.24	2.47	3.68	4.70	6.40	8.60	10.5	12.3	13.8	-	-
		X&Y-axis torque (N.m)(kgf.m)	118 {12.0}	118 {12.0}	118 {12.0}	118 {12.0}	116 {11.8}	112 {11.4}	101 {10.3}	91.1 {9.3}	83.3 {8.5}	78.4 {8.0}	73.5 {7.5}	-	-
		X-axis O.H.L. (N) (kgf)	3920 {400}	3920 {400}	3920 {400}	3920 {400}	3630 {370}	3330 {340}	2940 {300}	2450 {250}	2160 {220}	1960 {200}	1760 {180}	-	-
		Y-axis O.H.L. (N) (kgf)	4120 {420}	4120 {420}	4120 {420}	4120 {420}	4020 {410}	3920 {400}	3430 {350}	2940 {300}	2550 {260}	2450 {250}	2250 {230}	-	-
	HPCGBC -321	Allowable Power (kW)	0.36	0.88	1.77	3.53	5.26	6.72	9.15	12.3	15.0	17.5	19.7	-	-
		X&Y-axis torque (N.m)(kgf.m)	167 {17.0}	167 {17.0}	167 {17.0}	167 {17.0}	165 {16.8}	160 {16.3}	144 {14.7}	130 {13.3}	119 {12.1}	112 {11.4}	104 {10.6}	-	-
		X-axis O.H.L. (N) (kgf)	4900 {500}	4900 {500}	4900 {500}	4900 {500}	4610 {470}	4210 {430}	3720 {380}	3140 {320}	2740 {280}	2450 {250}	2160 {220}	-	-
		Y-axis O.H.L. (N) (kgf)	5190 {530}	5190 {530}	5190 {530}	5190 {530}	5100 {520}	4900 {500}	4310 {440}	3720 {380}	3230 {330}	3140 {320}	2840 {290}	-	-
	HPCGBC -401	Allowable Power (kW)	0.62	1.59	3.18	6.32	9.50	12.0	16.1	22.0	26.5	-	-	-	-
		X&Y-axis torque (N.m)(kgf.m)	294 {30.0}	294 {30.0}	294 {30.0}	294 {30.0}	294 {30.0}	284 {29.0}	255 {26.0}	231 {23.6}	211 {21.5}	-	-	-	-
		X-axis O.H.L. (N) (kgf)	9800 {1000}	9800 {1000}	9800 {1000}	7840 {800}	5880 {600}	4900 {500}	4410 {450}	3720 {380}	3430 {350}	-	-	-	-
		Y-axis O.H.L. (N) (kgf)	11760 {1200}	11760 {1200}	11760 {1200}	9800 {1000}	7350 {750}	6370 {650}	5880 {600}	5100 {520}	4020 {410}	-	-	-	-

For HPCGBC Performance Notes, see page 1.105

1.100

<https://amironic.co.il/>

HPCGBC Performance Chart

Speed ratio	Type	Specifications	X-axis revolutions per minute (min ⁻¹)												
			20	50	100	200	300	400	600	900	1200	1500	1800	2500	3600
1:2	HPCGBC -192	Allowable Power (kW)	0.03	0.07	0.14	0.27	0.40	0.53	0.78	1.15	1.50	1.85	2.17	2.20	2.20
		Y-axis torque (N.m){kgf.m}	25.5 {2.6}	25.5 {2.6}	25.5 {2.6}	25.5 {2.6}	25.5 {2.6}	24.5 {2.5}	24.5 {2.5}	24.5 {2.5}	23.5 {2.4}	23.5 {2.4}	22.5 {2.3}	16.7 {1.7}	10.8 {1.1}
		X-axis O.H.L. (N) {kgf}	1180 {120}	1180 {120}	1180 {120}	1180 {120}	1180 {120}	1130 {115}	1130 {115}	1080 {110}	1080 {110}	882 {90}	833 {85}	784 {80}	735 {75}
		Y-axis O.H.L. (N) {kgf}	1760 {180}	1760 {180}	1760 {180}	1760 {180}	1760 {180}	1720 {175}	1670 {170}	1470 {150}	1270 {130}	1080 {110}	980 {100}	833 {85}	784 {80}
	HPCGBC -252	Allowable Power (kW)	0.09	0.23	0.45	0.90	1.34	1.78	2.67	4.00	5.30	6.33	7.50	7.50	-
		Y-axis torque (N.m){kgf.m}	85.3 {8.7}	85.3 {8.7}	85.3 {8.7}	85.3 {8.7}	85.3 {8.7}	84.3 {8.6}	84.3 {8.6}	84.3 {8.6}	84.3 {8.6}	80.4 {8.2}	79.4 {8.1}	56.8 {5.8}	-
		X-axis O.H.L. (N) {kgf}	3920 {400}	3920 {400}	3920 {400}	3920 {400}	3920 {400}	3720 {380}	3630 {370}	3530 {360}	3230 {330}	2740 {280}	2250 {230}	1670 {170}	-
		Y-axis O.H.L. (N) {kgf}	4120 {420}	4120 {420}	4120 {420}	4120 {420}	4020 {410}	3920 {400}	3820 {390}	3720 {380}	3430 {350}	3040 {310}	2650 {270}	2350 {240}	-
	HPCGBC -322	Allowable Power (kW)	0.13	0.32	0.64	1.28	1.91	2.54	3.80	5.72	7.57	9.05	10.7	-	-
		Y-axis torque (N.m){kgf.m}	123 {12.5}	123 {12.5}	123 {12.5}	123 {12.5}	122 {12.4}	122 {12.4}	121 {12.3}	121 {12.3}	120 {12.2}	115 {11.7}	114 {11.6}	-	-
		X-axis O.H.L. (N) {kgf}	4900 {500}	4900 {500}	4900 {500}	4900 {500}	4900 {500}	4700 {480}	4610 {470}	4410 {450}	4120 {420}	3430 {350}	2840 {290}	-	-
		Y-axis O.H.L. (N) {kgf}	5190 {530}	5190 {530}	5190 {530}	5190 {530}	5100 {520}	4900 {500}	4800 {490}	4700 {480}	4310 {440}	3820 {390}	3330 {340}	-	-
	HPCGBC -402	Allowable Power (kW)	0.20	0.48	0.96	1.93	2.90	3.84	5.72	8.55	11.0	13.8	16.4	-	-
		Y-axis torque (N.m){kgf.m}	183 {18.7}	183 {18.7}	183 {18.7}	183 {18.7}	183 {18.7}	182 {18.6}	181 {18.5}	180 {18.4}	174 {17.8}	173 {17.6}	172 {17.5}	-	-
		X-axis O.H.L. (N) {kgf}	9800 {1000}	9800 {1000}	9800 {1000}	9800 {1000}	9800 {1000}	8820 {900}	7840 {800}	6860 {700}	5880 {600}	4900 {500}	3920 {400}	-	-
		Y-axis O.H.L. (N) {kgf}	11760 {1200}	11760 {1200}	11760 {1200}	11760 {1200}	11760 {1200}	9800 {1000}	8820 {900}	8820 {900}	8820 {900}	7840 {800}	6860 {700}	-	-

For HPCGBC Performance Notes, see page 1.105

Gearboxes

Spiral Bevel Gearboxes

HPCGBC

HPCGBC L TYPE
DISCOUNTS

1 - 5	List Price
6-19	-5%
20-39	-10%
40-59	-15%
60-99	-20%
100+	-25%

PART NUMBER	Speed ratio	A	Bb	C	Dp	Dg	E	Eo	F	H	J	Kp	Kg	ØM	N	P
HPCGBC-191L □	1:1	257	193	76	180	116	146	129	125	154	109	117.5	53.5	10.5	17	38
HPCGBC-192L □	1:2															
HPCGBC-251L □	1:1	316	259	90	222	157	177.5	155	152	188	133	146	81	14	20	50
HPCGBC-252L □	1:2															
HPCGBC-321L □	1:1	340	277	100	242	168	192.5	174	160	196	151	162	88	14	20	55
HPCGBC-322L □	1:2															
HPCGBC-401L □	1:1	425	337	115	308	208	225	200	195	234	173	210.5	110.5	14	22	75
HPCGBC-402L □	1:2															

PART NUMBER	R	ØS	ØV	X-axis Ø Up	Y-axis Ø Ug	Key NOTE 1	Backlash of shaft rotation NOTE 2	Weight (kgf)	PRICE EACH
HPCGBC-191L □	-	-	66	19	19	6 x 6 x 27	11' ~ 30'	10	£722.72
HPCGBC-192L □				18			17' ~ 47'		£747.22
HPCGBC-251L □	12	82.5	92	25	25	8 x 7 x 40	9' ~ 22'	17	£1005.98
HPCGBC-252L □							15' ~ 36'		£1028.96
HPCGBC-321L □	9	88.5	100	32	32	10 x 8 x 50	9' ~ 21'	22	£1376.53
HPCGBC-322L □							15' ~ 36'		£1410.24
HPCGBC-401L □	14	114.5	124	40	40	12 x 8 x 60	8' ~ 20'	33	£1675.13
HPCGBC-402L □							15' ~ 37'		£1727.19

CAUTION: Please place one of the orientation codes (A-P) from page 1.105 on the box at the end of the part number.

NOTE 1: The key dimensions are per JIS B 1301-1976 (Standard grade).

NOTE 2: The backlash angles are measured at the X-axis (input shaft).

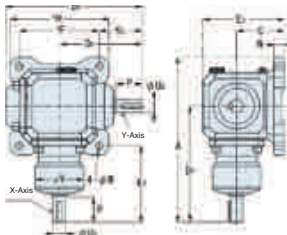
Caution 1: Sizes of the oil plugs are for the supply port → PF1/2 and for the drain port → PT1/4 (standard specifications).

Caution 2: The Bb dimension of L type, when the cover extends beyond the end of the base, is the dimension to the end of the cover.

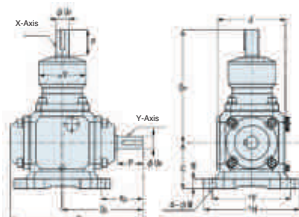
Caution 3: The key grooves in the X-axis and the Y-axis do not always coincide in phase with each other.

Caution 4: The tolerance of shaft diameter is JIS h6.

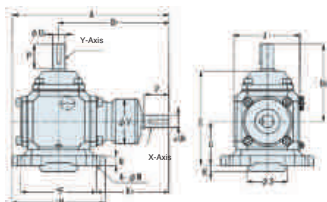
Since these products are assembled to each customer's specifications, the delivery takes several days. These units are not available from stock.



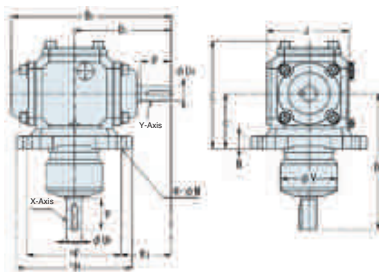
LA, LB Type
(LC, LD Type)



LI, LJ Type
(LK, LL Type)



LE, LF Type
(LG, LH Type)



LM, LN Type
(LO, LP Type)

Gearboxes

Spiral Bevel Gearboxes

HPCGBC

Gearboxes SPIRAL BEVEL GEARBOXES



HPCGBC T TYPE

DISCOUNTS	
1 - 5	List Price
6-19	-5%
20-39	-10%
40-59	-15%
60-99	-20%
100+	-25%

PART NUMBER	Speed ratio	A	Bc	C	Dp	Dg	E	EO	F	H	J	Kp	Kg	øM	N	P
HPCGBC-191T □	1:1	257	232	76	180	116	146	129	125	154	109	117.5	53.5	10.5	17	38
HPCGBC-192T □	1:2															
HPCGBC-251T □	1:1	316	314	90	222	157	177.5	155	152	188	133	146	81	14	20	50
HPCGBC-252T □	1:2															
HPCGBC-321T □	1:1	340	336	100	242	168	192.5	174	160	196	151	162	88	14	20	55
HPCGBC-322T □	1:2															
HPCGBC-401T □	1:1	425	416	115	308	208	225	200	195	234	173	210.5	110.5	14	22	75
HPCGBC-402T □	1:2															

PART NUMBER	R	øS	øV	X-axis ø Up	Y-axis ø Ug	Key NOTE 1	Backlash of shaft rotation NOTE 2	Weight (kgf)	PRICE EACH
HPCGBC-191T □	-	-	66	19	19	6 x 6 x 27	11' ~ 30'	10	£747.22
HPCGBC-192T □				18			17' ~ 47'		£774.78
HPCGBC-251T □	12	82.5	92	25	25	8 x 7 x 40	9' ~ 22'	18	£1028.96
HPCGBC-252T □							15' ~ 36'		£1058.04
HPCGBC-321T □	9	88.5	100	32	32	10 x 8 x 50	9' ~ 21'	23	£1410.22
HPCGBC-322T □							15' ~ 36'		£1431.25
HPCGBC-401T □	14	114.5	124	40	40	12 x 8 x 60	8' ~ 20'	34	£1727.19
HPCGBC-402T □							15' ~ 37'		£1777.71

CAUTION: Please place one of the orientation codes (A-P) from page 1.105 on the box at the end of the part number.

NOTE 1: The key dimensions are per JIS B 1301-1976 (Standard grade).

NOTE 2: The backlash angles are measured at the X-axis (input shaft).

Caution 1: Sizes of the oil plugs are for the supply port → PF1/2 and for the drain port → PT1/4 (standard specifications).

Caution 2: The Bb dimension of L type, when the cover extends beyond the end of the base, is the dimension to the end of the cover.

Caution 3: The key grooves in the X-axis and the Y-axis do not always coincide in phase with each other.

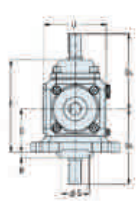
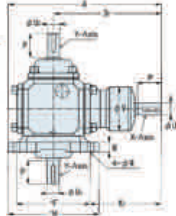
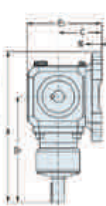
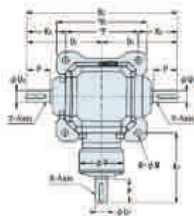
Caution 4: The tolerance of shaft diameter is JIS h6.

Since these products are assembled to each customer's specifications, the delivery takes several days. These units are not available from stock.

1.104

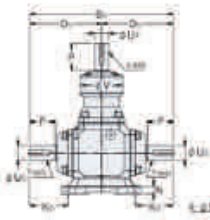


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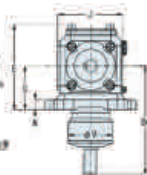
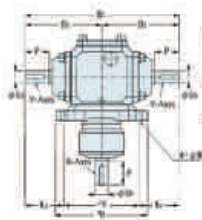


TA, TB Type

TC, TD Type



TE TF Type



TG, TH Type

Gearboxes

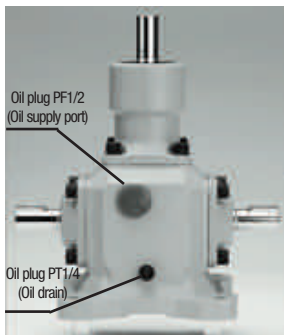
Spiral Bevel Gearboxes

HPCGBC

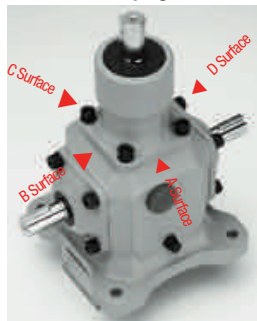
Mounting other than horizontally

The location of oil supply and drain plugs are designed for mounting the base horizontally. We can accept as a special order units that are mounted on the ceiling or on a wall. Please let us know at the time of ordering.

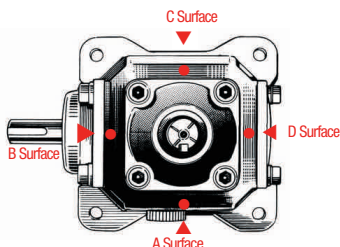
Standard specifications



Additional oil plug locations

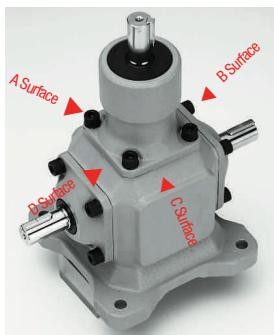


Additional oil plug locations



The mark "●" indicates the possible positions for additional oil plug PT1/4.

Additional oil plug locations



* Starting on the surface containing the standard oil plug as A, go clockwise looking from the top as B, C and D surfaces.