SPG MOTOR

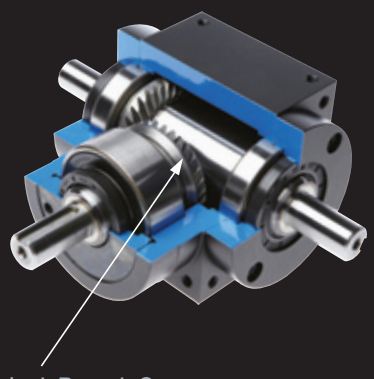
Spiral Bevel Gearboxes

www.spg.co.kr

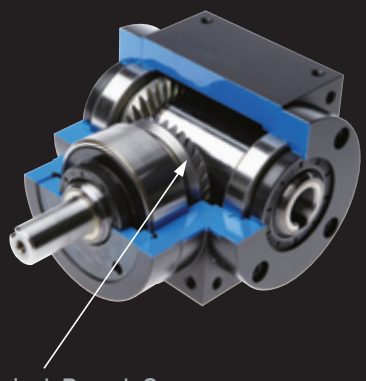
Spiral Bevel Gearbox is a high precision product developed by SPG that specializes in the manufacturing of Precision Geared Motor

SBT series

SPG Precision Bevel Gearbox, which is used widely in various industrial machines as a high precision and high strength structure's power dividing equipment, provides a robust function and performance to meet the customer's requirement.



Spiral Bevel Gear



Spiral Bevel Gear

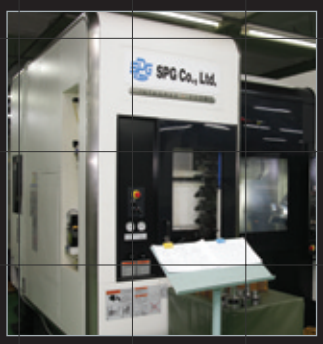
- **Compact Size and Lightweight Design**
  Allows the use of smaller servo & stepping motors
- **High Torque Transmission Capacity**
  Offers higher torque compared with conventional models and can even be downsized to improve cost efficiency
- **Diverse Model Lineup**
  The various high stiffness shaft layout gives customers the option to select the proper model based on their application.
- **Low Moment of Inertia**
  Enhances control capacity by low inertia moment design
- **High Efficiency**
  High transmission efficiency 90-98%!
- **High Precision**
  Realize low backlash (≤ around 15 arcmin) by adopting precision and spiral bevel gear
- **Low Noise**
  Approximately less than 75dB(A)
- **Long Life**
  Enhanced anti-abrasion and anti-shock capability by using spiral bevel gear whose material has undergone Furnace and Process Technology in Vacuum Carburizing from special steel
- **Excellent Seal Structure**
  Secured stability with high grade of protection 9IP65) to use product by adopting oil seal for input shaft, O-ring for case commissure and non-contacting seal bearing for input shaft
- **Free Mounting Direction and Compatibility**
  All directional mountings such as horizontal, vertical and sloped area are available. Enhanced mounting convenience by compatible design with other competitive models!
- **Simple Mounting to Various Servo and Stepping Motor**
  This is adoptable for each manufacturer by introducing motor mounting adapter flange and three-branched collet clamp and adapter busing. Simple mounting! (M, P series)
- **Convenience for Maintenance**
  No need for maintenance to add grease thanks to special grease injection!

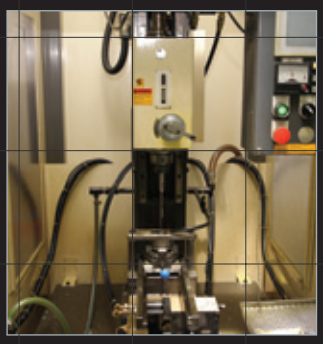
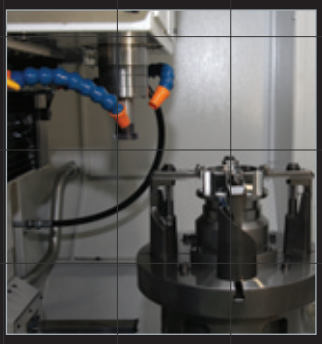
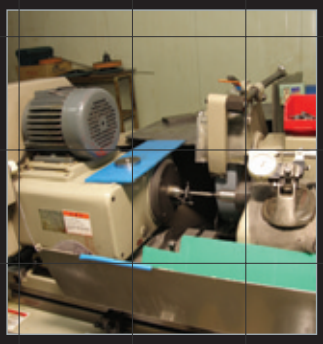
Quality First!
Customer Satisfaction is Our Goal

High Precision Performance & Reliability

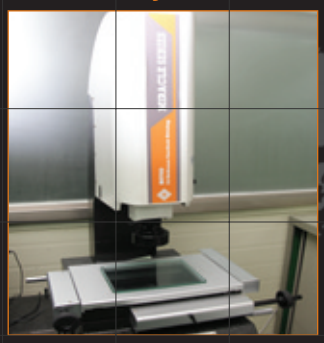
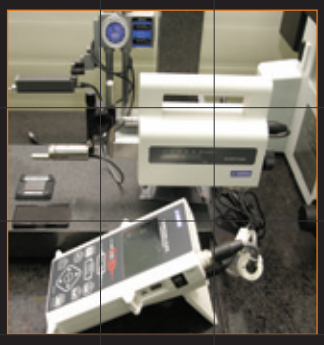
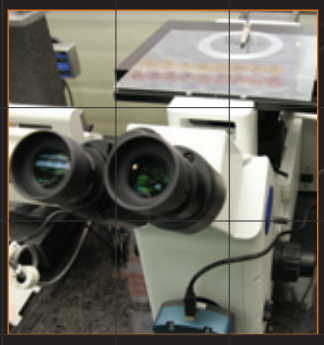
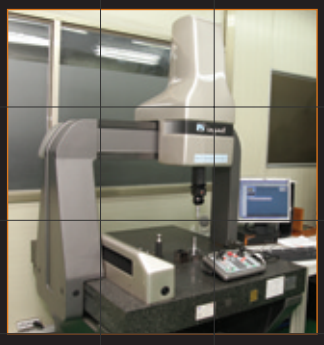
Manufacturing a wide range of Automatic Processing Equipment and Comprehensive Quality Control Equipment.

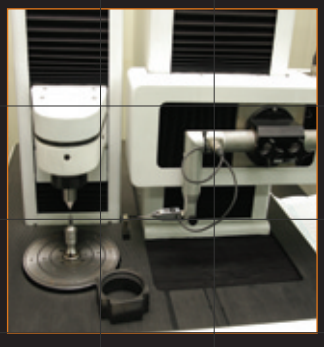
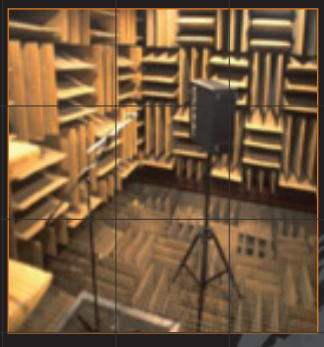
Processing



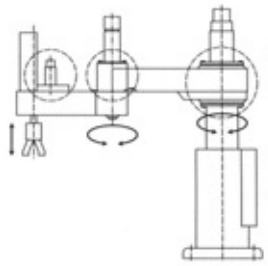
Quality Control

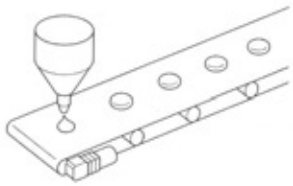



Applications

Scara Robot

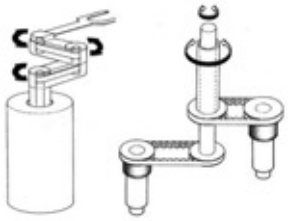


Belt Conveyor

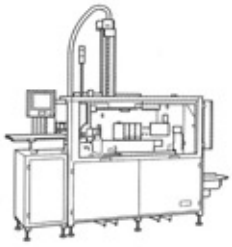


Printing Machine

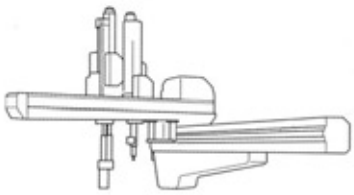
Wafer Transfer Robot



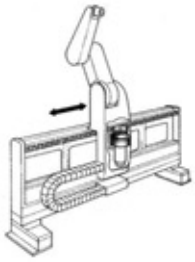
Automated Packing Machine



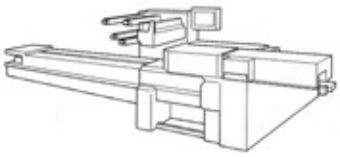
Gantry Robot



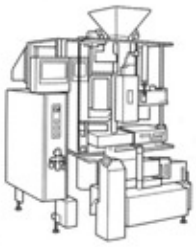
Robot(Rack&Pinion)



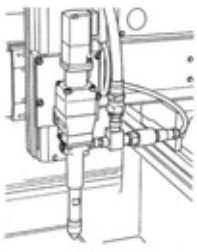
Fill Seal Machine(Horizontal Type)



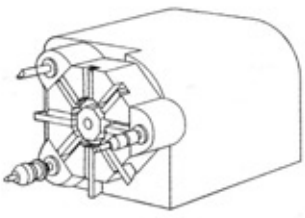
Fill Seal Machine(Vertical Type)



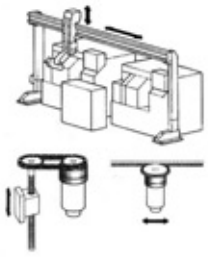
Dispenser Robot



Turret-Head



Loader Robot



- Parts Transfer Robot Systems
- Robot peripherals
- FA units
- Liquid glass return robots
- Semiconductor manufacturing devices
- Machine tools
- Loader drive shafts

- Printing Machinery
- Woodworking machinery
- Laser processing machinery
- Medical devices(CT)
- Monitoring & security cameras
- Bending Machinery
- Testing devices

- Measuring devices
- Pallet stackers
- Conveyors
- Extrusion machinery, blow-down devices etc. blow-down device etc.

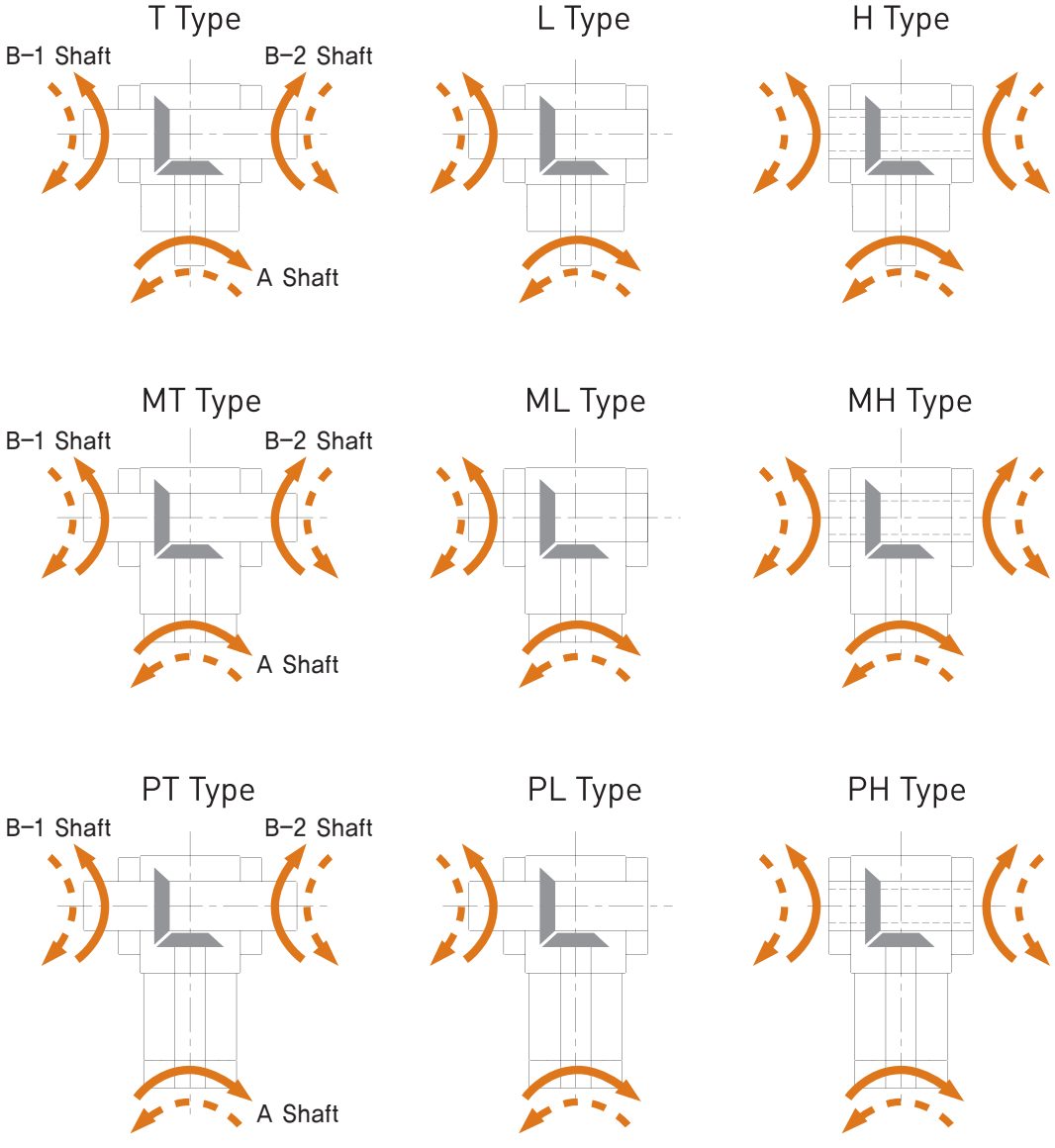
The Spiral Bevel Gearbox SBT series meet most of the specifications required by servo applications.

SPG Precision Spiral Bevel Gearboxes Classifications

Group		Figure	Series Name	Type	Frame Size	Ratio (i)	Page
Spiral Bevel Gearboxes	SBT		SBT-T	Standard	□25 ~ □142	1	8
			SBT-L		□25 ~ □142	1	9
			SBT-H		□65 ~ □142	1	10
			SBT-MT	Motor Mount (M-Series)	□25 ~ □142	1	13
			SBT-ML		□25 ~ □142	1	14
			SBT-MH		□65 ~ □142	1	15
			SBT-PT	Motor Mount (P-Series)	□50 ~ □142	3~10	18
			SBT-PL		□50 ~ □142	3~10	19
			SBT-PH		□65 ~ □142	3~10	20

Shaft layout and rotation direction

- Make sure to check the rotation directions for Input and output shafts since the rotation directions for the output shaft are dependent on the assembling location of bevel gear.
- Normal and reversed rotation are all available with the same capacity.
- The rotation directions below indicate the rotation of directional relation for each shaft.
- Key hole location for each shaft is not always matched.
- The reduction gear ratio 1:2 reduces A-shaft (Input) down to B shaft (Output).



Spiral Bevel Gearboxes
SBT □ Series (Standard Type)

▶Compact size

▶High precision, High purability

▶High efficiency

■ Specifications

Description	Unit	Stage	Ratio (1)	Model No.							
				SBT025T SBT025L	SBT030T SBT030L	SBT042T SBT042L	SBT050T SBT050L	SBT065T SBT065L SBT065H	SBT090T SBT090L SBT090H	SBT115T SBT115L SBT115H	SBT142T SBT142L SBT142H
Nominal Output Torque T_{2N} (1)	Nm	1	1	0.3	0.7	2.5	3.0	9.0	17	22	50
Max. Acceleration Torque T_{2B}	Nm	1	1	1.5 times of Nominal Output torque							
Nominal Input speed n_1	RPM	1	1	3,000	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input speed N_1	RPM	1	1	5,000	5,000	5,000	5,000	5,000	5,000	5,000	3,000
Backlash (Standard class)	arcmin	1	1	≤ 25			≤ 20		≤ 15		
Max. Overhang Load Input Fr max (1)	N	1	1	7	12	24	70	140	390	60	400
Max. Overhang Load Output Fa max (1)	N	1	1	38	56	120	88	110	200	600	800
Max. Thrust Load Input Fa max (1)	N	1	1	3.5	6	12	35	70	195	30	200
Max. Thrust Load Output Fa max (1)	N	1	1	19	28	60	44	55	100	300	400
Serivce Life (1)	hr	1	1	20,000							
Noise Level (2)	dB(A)	1	1	61	63	65	68	70	74	76	77
Weight	kg	1	1	0.2	0.35	0.9	0.8	1.8	4.5	9	18
Moment of Inertia (3)	kg ㎠	1	1	0.01	0.02	0.14	0.13	0.67	3.49	9.4	29.85
Operating Temp. (4)	℃	1	1	-10 ~ +90 ℃							
Lubrication		1	1	High temperature & Extreme pressure Lubricant							
Efficiency η	%	1	1	≥ 95%							

(1) Value for this specification table indicates that service factor is 1 at uniformed load for nominal input speed. Make sure to use it within the allowable limit from specification table. In case of data for Torque, Overhang Load and Thrust Load in continuous operation (S1 ≒ 10,000 hrs), allowable load location for shaft is the central part of the shaft based on 1-Output Shaft. In case of 2-Output Shaft, it's required to take into account sum of load given to each shaft and its value should be within range of the above data.

(2) Noise should be measured at 1 m of distance from mounting surface of reducer while a reducer is running at 1,500 rpm without load (Noise 21dB(A))

(3) IBased on Input Shaft and representative model (T Type).

(4) Make sure to use reducer at temperature range of -10℃ ~ +40℃ and within its surface temperature of 90℃.

※ Above data in the specification indicates the representative data and the specification may be changed to improve performance without prior notification.

■ Coding System

SBT | **065** | **T** | **S** | **001** | **K** | **A01**

Series Name	
SBT	Spiral Bevel Gearbox

Frame Size	
025	□25
030	□30
042	□42
050	□50
065	□65
090	□90
115	□115
142	□142

Type		
T	2-Output Shaft	Standard
L	1-Output Shaft	
H	Hollow Shaft	

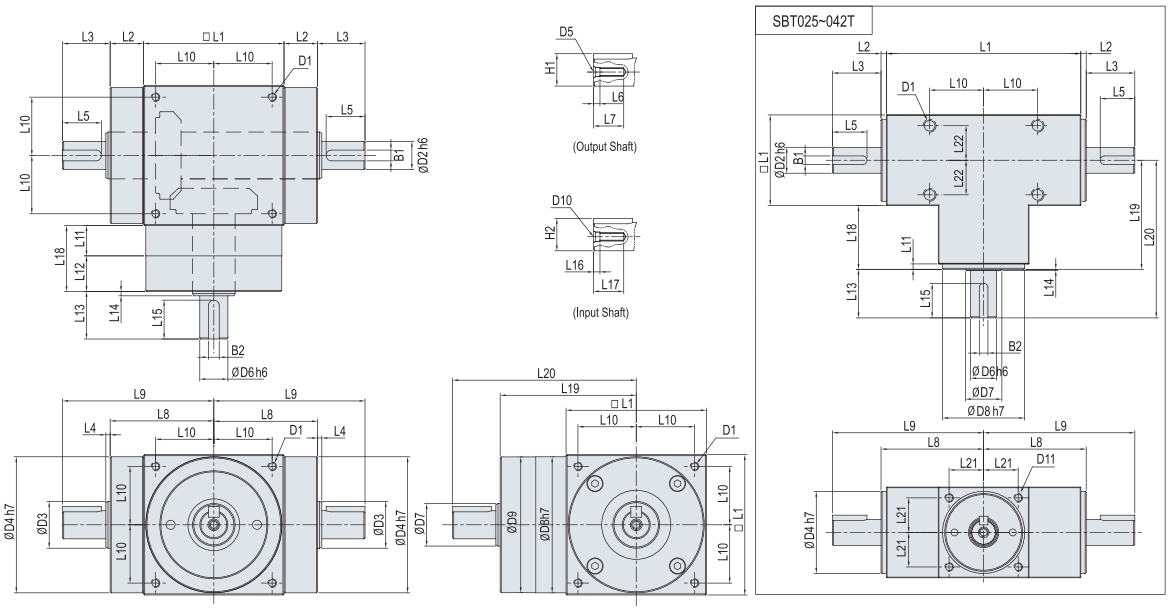
Backlash		
S	Standard Class	≤ 25~15 arcmin

Ratio (i)		
1 Stage	001	1/1

Output Shaft Option	
S	Shaft without key
K	Shaft with key
H	Hollow Shaft

Special order code

■ Dimensions (SBT 025/030/042/050/065/090/115/142T)

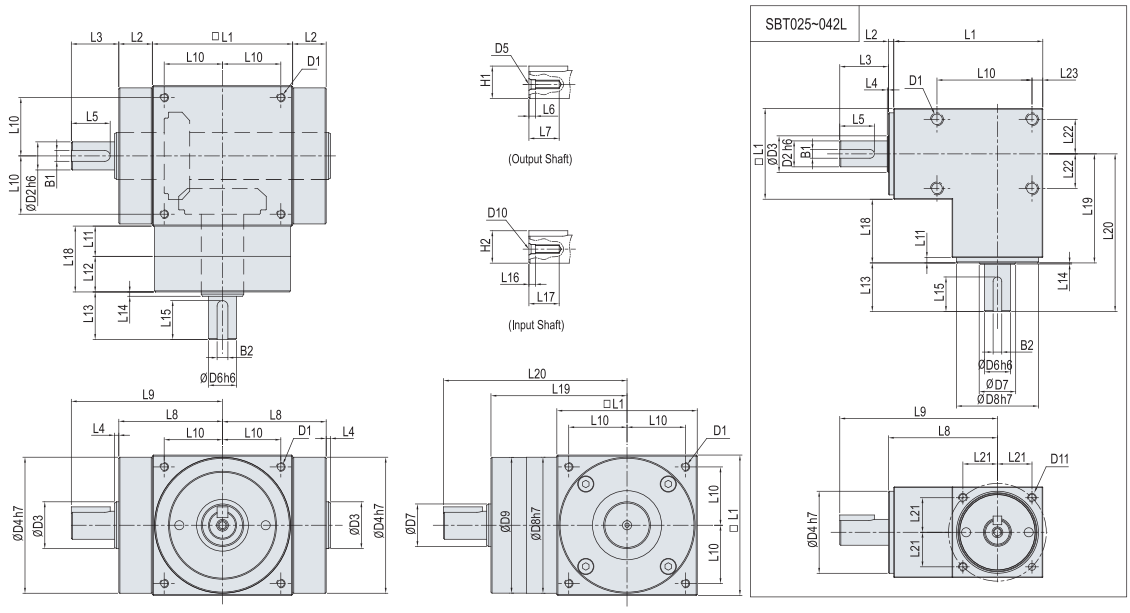


(Unit : mm)

Dimension \ Model	SBT025T	SBT030T	SBT042T	SBT050T	SBT065T	SBT090T	SBT115T	SBT142T
D1	M4 DP6	M5 DP6	M6 DP7	M4 DP9	M4 DP9	M6 DP12	M8 DP16	M10 DP18
D2 h6	6	8	12	12	13	18	22	32
D3	–	–	–	14.7	21.7	31.8	34.8	49.8
D4 h7	22	27	38	48	63	88	108	135
D5	4	5	6	4.3	4.3	5.5	8.5	12.5
D6 h6	6	8	12	12	13	18	22	32
D7	9.9	11.9	16.9	14.7	19.7	29.8	44.8	54.8
D8 h7	23	28	38	48	63	88	108	135
D9	–	–	–	47.9	62.9	87	107	134
D10	4	5	6	4.3	4.3	5.5	8.5	12.5
D11	M3 DP7	M3 DP7	M4 DP8	–	–	–	–	–
L1	57	65	90	50	65	90	115	142
L2	2	2	2.5	11.5	15.5	16.5	16.5	16.5
L3	13	18	22.5	20	22	37	42	52
L4	–	–	–	1	2	2	2	2
L5	–	–	16	16	18	32	36	47
L6	1.4	1.5	1.6	3	3	4	6	10
L7	M3 DP6	M4 DP7	M5 DP9	M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L8	30.5	34.5	47.5	36.5	48	61.5	74	87.5
L9	43.5	52.5	70	56.5	70	98.5	116	139.5
L10	16.5	17.5	25	20	27	36	44	55
L11	2	2	2.5	11	14	15	15	18
L12	–	–	–	13.5	16.5	18	27	32.5
L13	13	18	22.5	20	22	37	42	52
L14	0.5	0.5	0.5	1	2	2	2	2
L15	–	–	16	16	18	32	36	47
L16	1.4	1.5	1.6	3	3	4	6	10
L17	M3 DP6	M4 DP7	M5 DP9	M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L18	19	20.5	29.5	24.5	30.5	37	42	50.5
L19	31.5	35.5	50.5	49.5	63	78	99.5	121.5
L20	44.5	53.5	73	69.5	85	115	141.5	173.5
L21	9.5	11.5	16	–	–	–	–	–
L22	9	11	16	–	–	–	–	–
B1 h9	–	–	4	4	5	6	6	10
B2 h9	–	–	4	4	5	6	6	10
H1	–	–	13.5	13.5	15	20.5	24.5	35
H2	–	–	13.5	13.5	15	20.5	24.5	35

Note) 1. Specifications are subject to change without notice for improvement.
2. CAD files are available for download from our website at www.spg.co.kr.

■ Dimensions (SBT 025/030/042/050/065/090/115/142L)



(Unit : mm)

Dimension \ Model	SBT025L	SBT030L	SBT042L	SBT050L	SBT065L	SBT090L	SBT115L	SBT142L
D1	M4 DP6	M5 DP6	M6 DP7	M4 DP9	M4 DP9	M6 DP12	M8 DP16	M10 DP18
D2 h6	6	8	12	12	13	18	22	32
D3	9.9	11.9	16.9	14.7	21.7	31.8	34.8	49.8
D4 h7	22	27	38	48	63	88	108	135
D5	4	5	6	4.3	4.3	5.5	8.5	12.5
D6 h6	6	8	12	12	13	18	22	32
D7	9.9	11.9	16.9	14.7	19.7	29.8	44.8	54.8
D8 h7	23	28	38	48	63	88	108	135
D9	–	–	–	47.9	62.9	87	107	134
D10	4	5	6	4.3	4.3	5.5	8.5	12.5
D11	M3 DP7	M3 DP7	M4 DP8	–	–	–	–	–
L1	42	48.5	69	50	65	90	115	142
L2	2	2	2.5	11.5	15.5	16.5	16.5	16.5
L3	13	18	22.5	20	22	37	42	52
L4	0.5	0.5	0.5	1	2	2	2	2
L5	–	–	16	16	18	32	36	47
L6	1.4	1.5	1.6	3	3	4	6	10
L7	M3 DP6	M4 DP7	M5 DP9	M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L8	31.5	35.5	50.5	36.5	48	61.5	74	87.5
L9	44.5	53.5	73	56.5	70	98.5	116	139.5
L10	23	27	44	20	27	36	44	55
L11	2	2	2.5	11	14	15	15	18
L12	–	–	–	13.5	16.5	18	27	32.5
L13	13	18	22.5	20	22	37	42	52
L14	0.5	0.5	0.5	1	2	2	2	2
L15	–	–	16	16	18	32	36	47
L16	1.4	1.5	1.6	3	3	4	6	10
L17	M3 DP6	M4 DP7	M5 DP9	M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L18	19	20.5	29.5	24.5	30.5	37	42	50.5
L19	31.5	35.5	50.5	49.5	63	78	99.5	121.5
L20	44.5	53.5	73	69.5	85	115	141.5	173.5
L21	9.5	11.5	16	–	–	–	–	–
L22	9	11	16	–	–	–	–	–
L23	3.5	4	5	–	–	–	–	–
B1 h9	–	–	4	4	5	6	6	10
B2 h9	–	–	4	4	5	6	6	10
H1	–	–	13.5	13.5	15	20.5	24.5	35
H2	–	–	13.5	13.5	15	20.5	24.5	35

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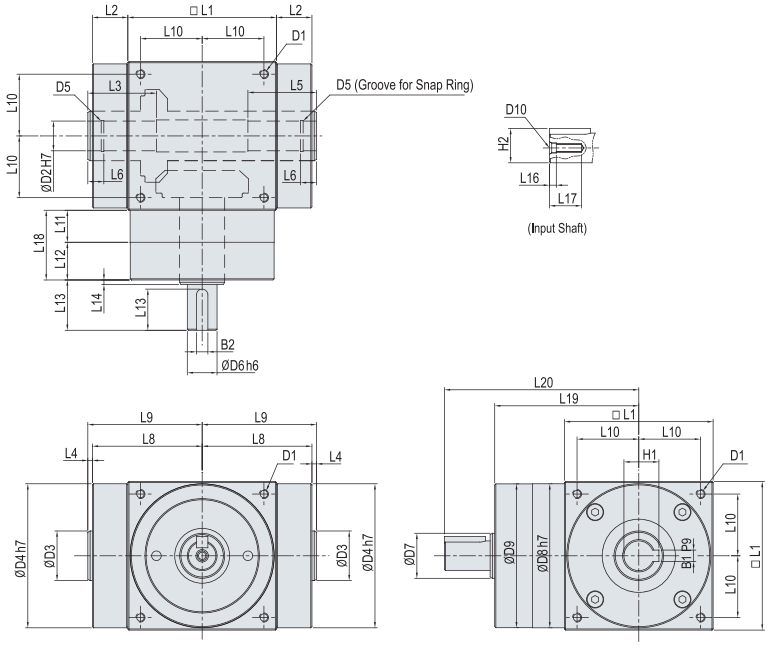
■ Dimensions (SBT 065/090/115/142H)



(Unit : mm)

Dimension \ Model	SBT065H	SBT090H	SBT115H	SBT142H
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 *ø13.6	1.15 * ø19	1.15 * ø23	1.35 * ø33.7
D6 h6	13	18	22	32
D7	17.7	27.3	41.6	51.3
D8 h7	63	88	108	135
D9	62.9	87	107	134
D10	4.3	5.5	8.5	12.5
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	14	15	15	18
L12	16.5	18	27	32.5
L13	22	37	42	52
L14	2	2	2	2
L15	18	32	36	47
L16	3	4	6	10
L17	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L18	30.5	37	42	50.5
L19	63	78	99.5	121.5
L20	85	115	141.5	173.5
B1 P9	5	6	6	10
B2 h9	5	6	6	10
H1	15.3	20.8	24.8	35.3
H2	15	20.5	24.5	35

Note) 1. Specifications are subject to change without notice for improvement.
2. CAD files are available for download from our website at www.spg.co.kr.

Spiral Bevel Gearboxes
SBT- M Series (Motor Mount Type)

- ▶Compact size
- ▶High precision, High durability
- ▶High efficiency
- ▶Simple mounting for various servo and stepping motors

■ Specifications

Description	Unit	Stage	Ratio (1)	Model No.							
				SBT025MT SBT025ML	SBT030MT SBT030ML	SBT042MT SBT042ML	SBT050MT SBT050ML	SBT065MT SBT065ML SBT065MH	SBT090MT SBT090ML SBT090MH	SBT115MT SBT115ML SBT115MH	SBT142MT SBT142ML SBT142MH
Nominal Output Torque T_{2N} (1)	Nm	1	1	0.3	0.7	2.5	3.0	9.0	17	22	50
Max. Acceleration Torque T_{2B}	Nm	1	1	1.5 times of Nominal Output torque							
Nominal Input speed n_1	RPM	1	1	3,000	3,000	3,000	3,000	3,000	3,000	3,000	2,000
Max. Input speed N_1	RPM	1	1	5,000	5,000	5,000	5,000	5,000	5,000	5,000	3,000
Backlash (Standard class)	arcmin	1	1	≤ 25			≤ 20		≤ 15		
Max. Overhang Load Input Fr max (1)	N	1	1	7	12	24	70	140	390	60	400
Max. Overhang Load Output Fa max (1)	N	1	1	38	56	120	88	110	200	600	800
Max. Thrust Load Input Fa max (1)	N	1	1	3.5	6	12	35	70	195	30	200
Max. Thrust Load Output Fa max (1)	N	1	1	19	28	60	44	55	100	300	400
Serivce Life (1)	hr	1	1	20,000							
Noise Level (2)	dB(A)	1	1	61	63	65	68	70	74	76	77
Weight	kg	1	1	0.2	0.35	0.9	0.9	2.0	4.8	10	20
Moment of Inertia (3)	kg cm^2	1	1	0.01	0.04	0.23	0.15	0.75	3.63	10.25	32.61
Operating Temp. (4)	℃	1	1	−10 ~ +90 ℃							
Lubrication		1	1	High temperature & Extreme pressure Lubricant							
Efficiency η	%	1	1	≥ 95%							

(1) Value for this specification table indicates that service factor is 1 at uniformed load for nominal input speed. Make sure to use it within the allowable limit from specification table. In case of data for Torque, Overhang Load and Thrust Load in continuous operation (S1 ≒ 10,000 hrs), allowable load location for shaft is the central part of the shaft based on 1-Output Shaft. In case of 2-Output Shaft, it's required to take into account sum of load given to each shaft and its value should be within range of the above data.

(2) Noise should be measured at 1 m of distance from mounting surface of reducer while a reducer is running at 1,500 rpm without load (Noise 21dB(A))

(3) IBased on Input Shaft and representative model (T Type).

(4) Make sure to use reducer at temperature range of −10℃ ~ +40℃ and within its surface temperature of 90℃.

※ Above data in the specification indicates the representative data and the specification may be changed to improve performance without prior notification.

■ Coding System

SBT | **065** | **MT** | **S** | **001** | **K** | **A01**

Series Name	
SBT	Spiral Bevel Gearbox

Frame Size	
025	□25
030	□30
042	□42
050	□50
065	□65
090	□90
115	□115
142	□142

Type		
MT	2-Output Shaft	Motor Mount (M-Series)
ML	1-Output Shaft	
MH	Hollow Shaft	

※ Flange for SBT025, 030's Motor Mount is delivered by special order

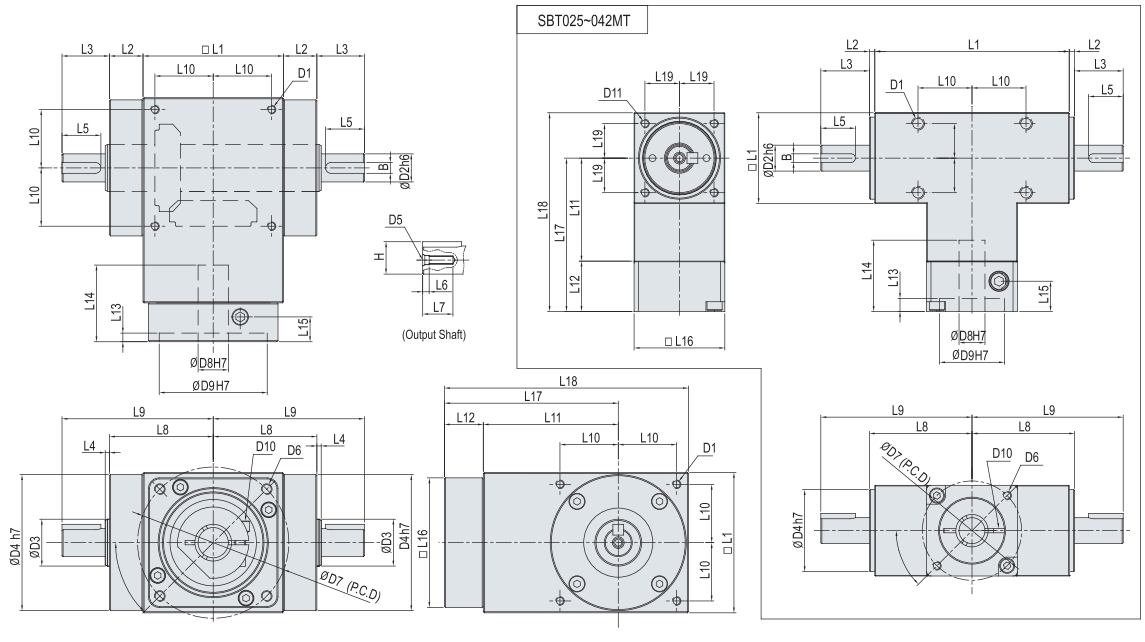
Backlash		
S	Standard Class	≤ 25~15 arcmin

Ratio (i)		
1 Stage	001	1/1

Output Shaft Option	
S	Shaft without key
K	Shaft with key
H	Hollow Shaft

Special order code

■ Dimensions (SBT 025/030/042/050/065/090/115/142MT)

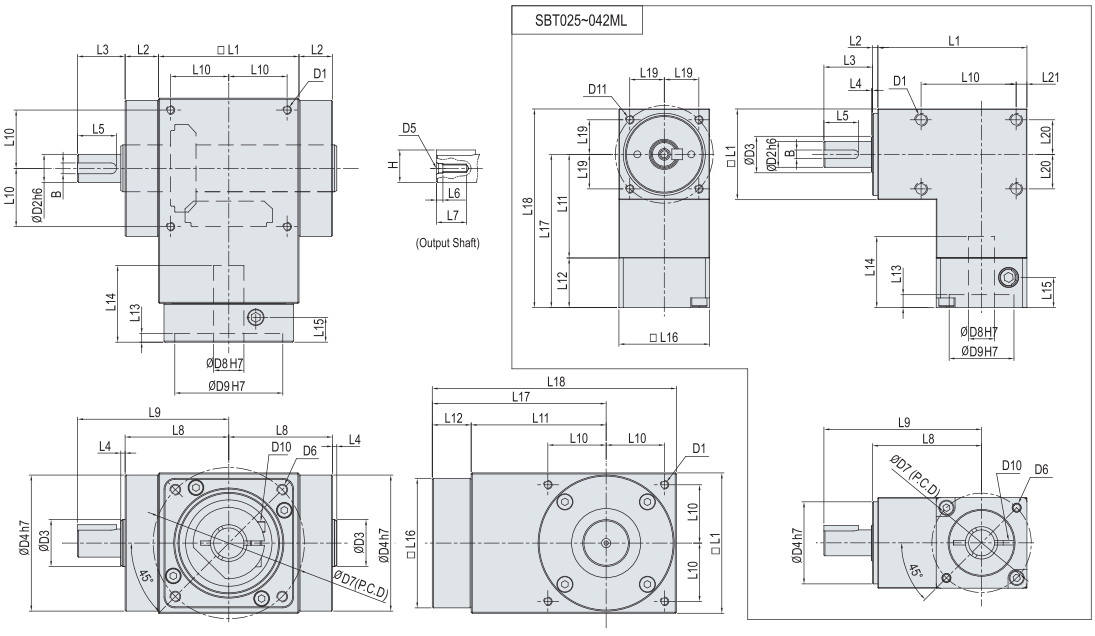


(Unit : mm)

Dimension \ Model		SBT025MT	SBT030MT	SBT042MT	SBT050MT	SBT065MT	SBT090MT	SBT115MT	SBT142MT
D1		M4 DP6	M5 DP6	M6 DP7	M4 DP9	M4 DP9	M6 DP12	M8 DP16	M10 DP18
D2 h6		6	8	12	12	13	18	22	32
D3		–	–	–	14.7	21.7	31.8	34.8	49.8
D4 h7		22	27	38	48	63	88	108	135
D5		4	5	6	4.3	4.3	5.5	8.5	12.5
D6	A	ø 3.4 DP5	ø 2.9 DP5.5	M4 DP7	M4 DP8	M5 DP12	M6 DP12	M8 DP20	M12 DP21
	B	–	–	–	M3 DP6	M4 DP12	M5 DP12	–	–
D7	A	24.5	32.5	46	46	70	90	145	200
	B	–	–	–	45	70	90	–	–
D8 H7		6	8	12	8	14	19	32	38
D9 H7		20	22	30	30	50	70	110	114.3
D10		M2.5	M3	M5	M3	M5	M5	M8	M8
D11		M3 DP7	M3 DP7	M4 DP8	–	–	–	–	–
L1		57	65	90	50	65	90	115	142
L2		2	2	2.5	11.5	15.5	16.5	16.5	16.5
L3		13	18	22.5	20	22	37	42	52
L4		–	–	–	1	2	2	2	2
L5		–	–	16	16	18	32	36	47
L6		1.4	1.5	1.6	3	3	4	6	10
L7		M3 DP6	M4 DP7	M5 DP9	M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L8		30.5	34.5	47.5	36.5	48	61.5	74	87.5
L9		43.5	52.5	70	56.5	70	98.5	116	139.5
L10		16.5	17.5	25	20	27	36	44	55
L11		29.5	33.5	48	48.5	62.5	78	97.5	120
L12		19	19	22.5	13.5	18	18	42	46
L13		8	8	6	3.5	4	4	7	7
L14		25	29	33	27	35.5	42.5	73	84
L15		13.25	12.75	14	8.25	11.5	11.5	27.5	33.5
L16		25	30	42	42	60	90	130	180
L17		48.5	52.5	70.5	62	80.5	96	139.5	166
L18		61	67.5	91.5	87	113	141	197	237
L19		9.5	11.5	16	–	–	–	–	–
L20		9	11	16	–	–	–	–	–
B h9		–	–	4	4	5	6	6	10
H		–	–	13.5	13.5	15	20.5	24.5	35

Note) 1. Specifications are subject to change without notice for improvement.
2. The values of D6 through D10 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.

■ Dimensions (SBT 025/030/042/050/065/090/115/142ML)

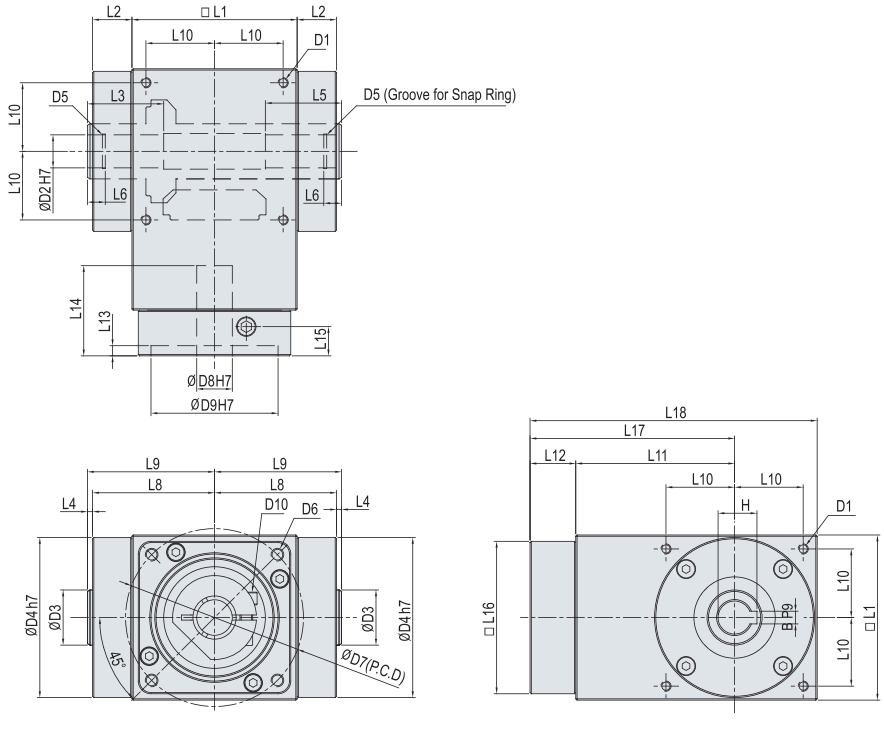


(Unit : mm)

Dimension \ Model		SBT025ML	SBT030ML	SBT042ML	SBT050ML	SBT065ML	SBT090ML	SBT115ML	SBT142ML
D1		M4 DP6	M5 DP6	M6 DP7	M4 DP9	M4 DP9	M6 DP12	M8 DP16	M10 DP18
D2 h6		6	8	12	12	13	18	22	32
D3		9.9	11.9	16.9	14.7	21.7	31.8	34.8	49.8
D4 h7		22	27	38	48	63	88	108	135
D5		4	5	6	4.3	4.3	5.5	8.5	12.5
D6	A	M3 DP6	M3 DP6	M4 DP7	M4 DP8	M5 DP12	M6 DP12	M8 DP20	M12 DP21
	B	–	–	–	M3 DP6	M4 DP12	M5 DP12	–	–
D7	A	28	28	46	46	70	90	145	200
	B	–	–	–	45	70	90	–	–
D8 H7		6	8	12	8	14	19	32	38
D9 H7		20	22	30	30	50	70	110	114.3
D10		M2.5	M3	M5	M3	M5	M5	M8	M8
D11		M3 DP7	M3 DP7	M4 DP8	–	–	–	–	–
L1		42	48.5	69	50	65	90	115	142
L2		2	2	2.5	11.5	15.5	16.5	16.5	16.5
L3		13	18	22.5	20	22	37	42	52
L4		0.5	0.5	0.5	1	2	2	2	2
L5		–	–	16	16	18	32	36	47
L6		1.4	1.5	1.6	3	3	4	6	10
L7		M3 DP6	M4 DP7	M5 DP9	M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L8		31.5	35.5	50.5	36.5	48	61.5	74	87.5
L9		44.5	53.5	73	56.5	70	98.5	116	139.5
L10		23	27	44	20	27	36	44	55
L11		29.5	33.5	48	48.5	62.5	78	97.5	120
L12		19	19	22.5	13.5	18	18	42	46
L13		8	8	6	3.5	4	4	7	7
L14		25	29	33	27	35.5	42.5	73	84
L15		13.25	12.75	14	8.25	11.5	11.5	27.5	33.5
L16		25	30	42	42	60	90	130	180
L17		48.5	52.5	70.5	62	80.5	96	139.5	166
L18		61	67.5	91.5	87	113	141	197	237
L19		9.5	11.5	16	–	–	–	–	–
L20		9	11	16	–	–	–	–	–
L21		3.5	4	5	–	–	–	–	–
B h9		–	–	4	4	5	6	6	10
H		–	–	13.5	13.5	15	20.5	24.5	35

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.

■ Dimensions (SBT 065/090/115/142MH)



(Unit : mm)

Dimension \ Model		SBT065MH	SBT090MH	SBT115MH	SBT142MH
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 * ø13.6	1.15 * ø19	1.15 * ø23	1.35 * ø33.7
D6	A	M5 DP12	M6 DP12	M8 DP20	M12 DP21
	B	M4 DP12	M5 DP12	–	–
D7	A	70	90	145	200
	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		62.5	78	97.5	120
L12		18	18	42	46
L13		4	4	7	7
L14		35.5	42.5	73	84
L15		11.5	11.5	27.5	33.5
L16		60	90	130	180
L17		80.5	96	139.5	166
L18		113	141	197	237
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.

Spiral Bevel Gearboxes
SBT-P Series (Motor Mount Type)

- ▶Applying helical gear for planetary gearheads
- ▶Compact size
- ▶High precision, High durability
- ▶High efficiency
- ▶Simple mounting for various servo and stepping motors

■ Specifications

Description	Unit	Stage	Ratio (1)	Model No.				
				SBT050PT SBT050PL	SBT065PT SBT065PL SBT065PH	SBT090PT SBT090PL SBT090PH	SBT115PT SBT115PL SBT115PH	SBT142PT SBT142PL SBT142PH
Nominal Output Torque T_{2N} (2)	Nm	2	3~10	6	16	34	54	100
Max. Acceleration Torque T_{2B}	Nm	2	3~10	1.5 times of Nominal Output torque				
Nominal Input speed n_1	RPM	2	3~10	3,000	3,000	3,000	3,000	2,000
Max. Input speed N_1	RPM	2	3~10	5,000	5,000	5,000	5,000	3,000
Backlash (Standard class)	arcmin	2	3~10	≤ 23		≤ 18		
Max. Overhang Load Input Fr max (2)	N	2	3~10	88	110	200	600	800
Max. Overhang Load Output Fa max (2)	N	2	3~10	44	55	100	300	400
Serivce Life (2)	hr	2	3~10	20,000				
Noise Level (3)	dB(A)	2	3~10	68	70	74	76	77
Weight	kg	2	3~10	1.2	2.5	7	15	25
Moment of Inertia (4)	kg ㎠	2	3~10	0.07	0.38	2.13	6.33	24.7
Operating Temp. (5)	℃	2	3~10	-10 ~ +90 ℃				
Lubrication		2	3~10	High temperature & Extreme pressure Lubricant				
Mounting		2	3~10	All directions				
Efficiency η	%	2	3~10	≥ 93				

(1) Value for this specification table indicates that service factor is 1 at uniformed load for nominal input speed. Make sure to use it within the allowable limit from specification table. In case of data for Torque, Overhang Load and Thrust Load in continuous operation (S1 ≒ 10,000 hrs), allowable load location for shaft is the central part of the shaft based on 1-Output Shaft. In case of 2-Output Shaft, it's required to take into account sum of load given to each shaft and its value should be within range of above the data.

(2) Noise should be measured at 1 m of distance from mounting surface of reducer while a reducer is running at 1,500 rpm without load (Noise 21dB(A))

(3) IBased on Input Shaft and representative model (T Type).

(4) Make sure to use reducer at temperature range of -10℃ ~ +40℃ and within its surface temperature of 90℃.

※ Above data in the specification indicates the representative data and the specification may be changed to improve performance without prior notification.

■ Coding System

SBT | **065** | **PT** | **S** | **003** | **K** | **A01**

Series Name	
SBT	Spirl Bevel Gearbox

※Planetary gearheads part : Helical gear Type

Frame Size	
050	□50
065	□65
090	□90
115	□115
142	□142

Type		
PT	2-Output Shaft	Motor Mount (P-Series)
PL	1-Output Shaft	
PH	Hollow Shaft	

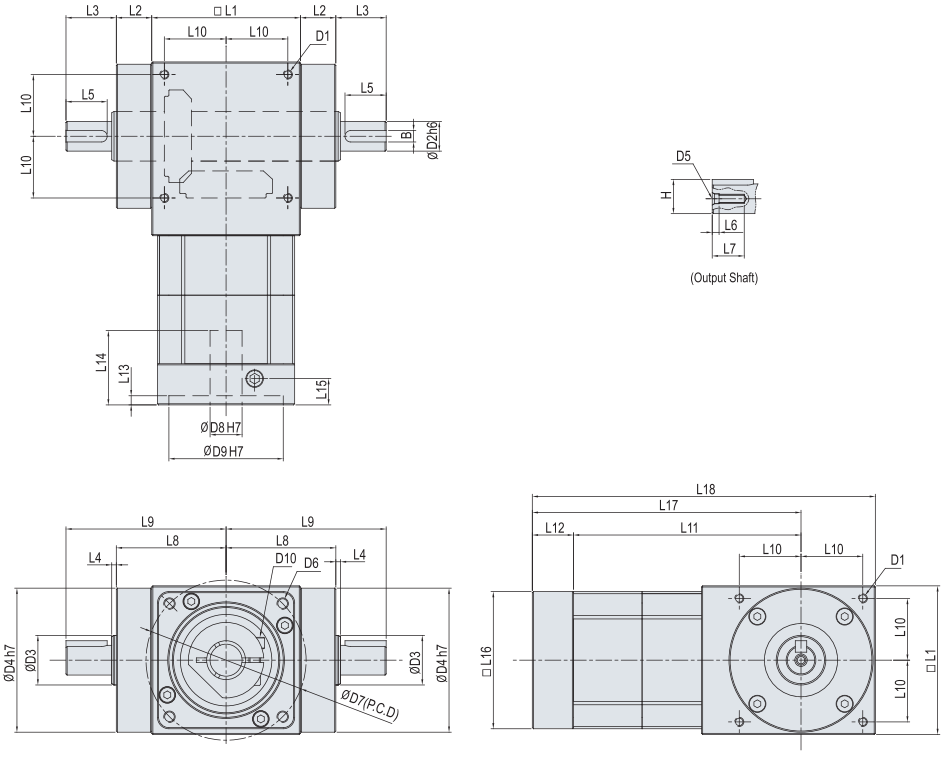
Backlash		
S	Standard Class	≤ 23~18 arcmin

Ratio (i)		
2 Stage	003	1/3
	005	1/5
	010	1/0

Output Shaft Option	
S	Shaft without key
K	Shaft with key
H	Hollow Shaft

Special order code

■ Dimensions (SBT 050/065/090/115/142PT) 2-Stage, Ratio i = 3~10

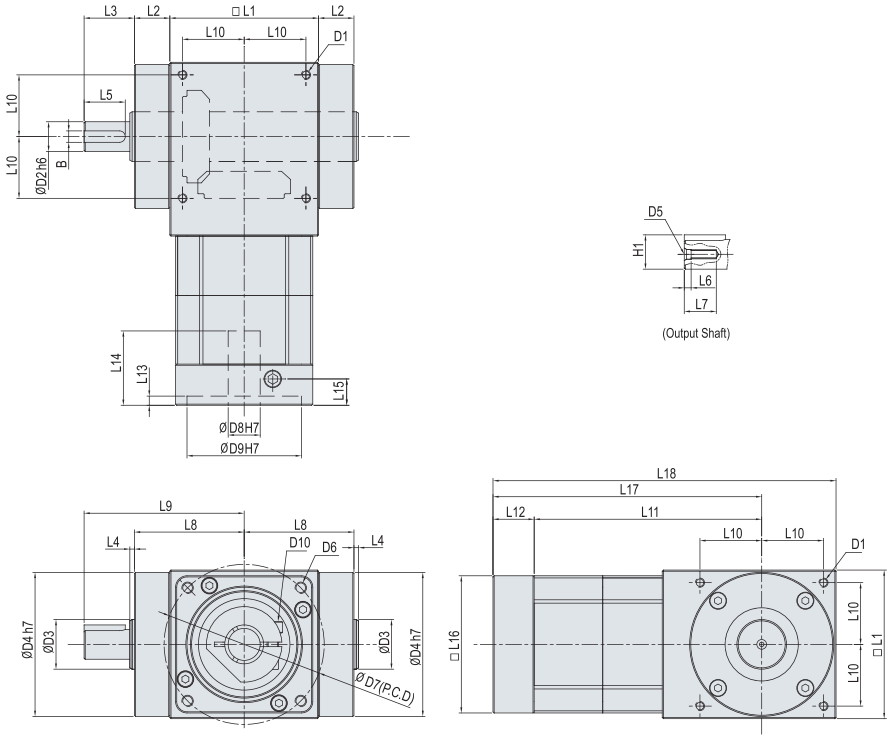


(Unit : mm)

Dimension \ Model		SBT050PT	SBT065PT	SBT090PT	SBT115PT	SBT142PT
D1		M4 DP9	M4 DP9	M6 DP12	M8 DP16	M10 DP18
D2 h6		12	13	18	22	32
D3		14.7	21.7	31.8	34.8	49.8
D4 h7		48	63	88	108	135
D5		4.3	4.3	5.5	8.5	12.5
D6	A	M4 DP8	M5 DP12	M6 DP12	M8 DP20	M12 DP21
	B	M3 DP6	M4 DP12	M5 DP12	–	–
D7	A	46	70	90	145	200
	B	45	70	90	–	–
D8 H7		8	14	19	32	38
D9 H7		30	50	70	110	114.3
D10		M3	M5	M5	M8	M8
L1		50	65	90	115	142
L2		11.5	15.5	16.5	16.5	16.5
L3		20	22	37	42	52
L4		1	2	2	2	2
L5		16	18	32	36	47
L6		3	3	4	6	10
L7		M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L8		36.5	48	61.5	74	87.5
L9		56.5	70	98.5	116	139.5
L10		20	27	36	44	55
L11		84.5	99.5	138	175.5	215.5
L12		13.5	18	18	42	42.5
L13		3.5	4	4	7	7
L14		27	32.5	42.5	73	84
L15		8.25	11.5	11.5	27.5	33.5
L16		42	60	90	130	180
L17		98	117.5	156	217.5	258
L18		123	150	201	275	329
B h9		4	5	6	6	10
H		13.5	15	20.5	24.5	35

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.

■ Dimensions (SBT 050/065/090/115/142PL) 2-Stage, Ratio i = 3~10

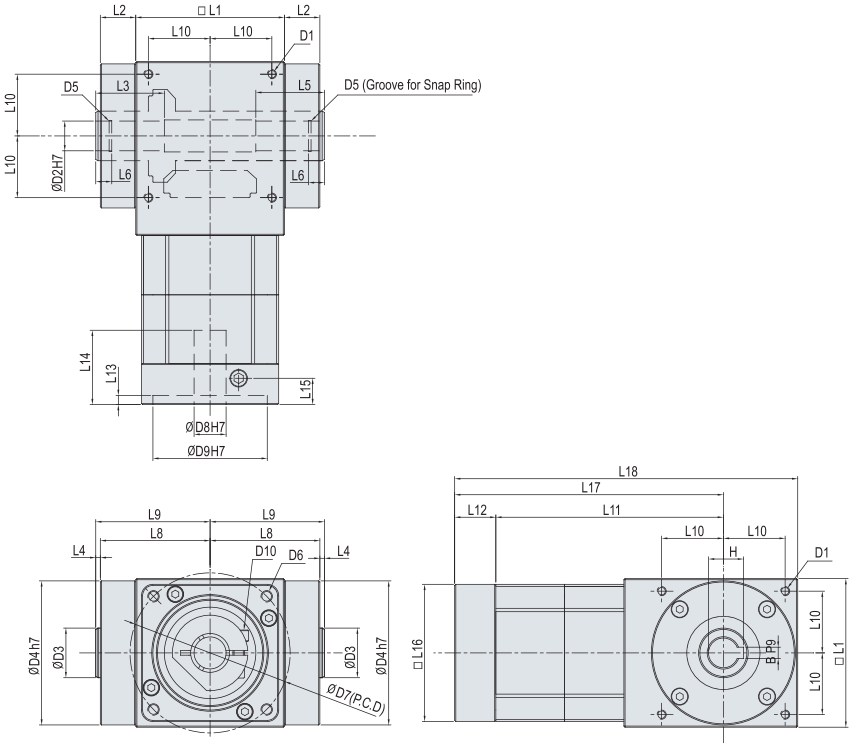


(Unit : mm)

Dimension \ Model		SBT050PL	SBT065PL	SBT090PL	SBT115PL	SBT142PL
D1		M4 DP9	M4 DP9	M6 DP12	M8 DP16	M10 DP18
D2 h6		12	13	18	22	32
D3		14.7	21.7	31.8	34.8	49.8
D4 h7		48	63	88	108	135
D5		4.3	4.3	5.5	8.5	12.5
D6	A	M4 DP8	M5 DP12	M6 DP12	M8 DP20	M12 DP21
	B	M3 DP6	M4 DP12	M5 DP12	–	–
D7	A	46	70	90	145	200
	B	45	70	90	–	–
D8 H7		8	14	19	32	38
D9 H7		30	50	70	110	114.3
D10		M3	M5	M5	M8	M8
L1		50	65	90	115	142
L2		11.5	15.5	16.5	16.5	16.5
L3		20	22	37	42	52
L4		1	2	2	2	2
L5		16	18	32	36	47
L6		3	3	4	6	10
L7		M4 DP13	M4 DP14	M5 DP17	M8 DP25	M12 DP28
L8		36.5	48	61.5	74	87.5
L9		56.5	70	98.5	116	139.5
L10		20	27	36	44	55
L11		84.5	99.5	138	175.5	215.5
L12		13.5	18	18	42	42.5
L13		3.5	4	4	7	7
L14		27	32.5	42.5	73	84
L15		8.25	11.5	11.5	27.5	33.5
L16		42	60	90	130	180
L17		98	117.5	156	217.5	258
L18		123	150	201	275	329
B h9		4	5	6	6	10
H		13.5	15	20.5	24.5	35

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.

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



(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 * Ø13.6	1.15 * Ø19	1.15 * Ø23	1.35 * Ø33.7
D6	A	M5 DP12	M6 DP12	M8 DP20	M12 DP21
	B	M4 DP12	M5 DP12	–	–
D7	A	70	90	145	200
	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.

■ 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 ℃ / Minimum ℃ ~ Maximum ℃)		
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 (T_e) = Load torque given to bevel gear (T_f) × Service Factor (S_f) [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 (Sf)		
	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.

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)

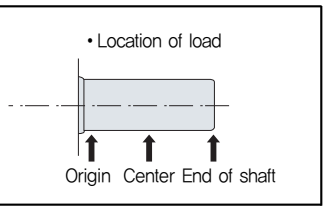
※ Be sure that the O.H.L(N), calculated by the above formula, is less than the allowable O.H.L (N) value by the specification table in the catalogue(page 7, 12, 17).

(Table2)

Connection type	K
Chain, Timming 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

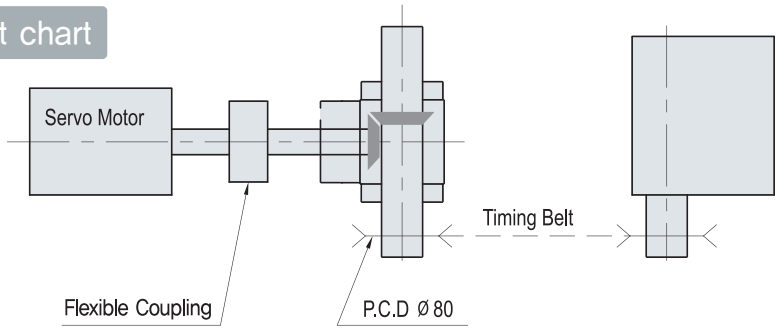
◆ Check and select a model from the specification table as shown in the catalogue that satisfies all of the result values at above, 1,2, and 3.

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 ℃ / Minimum 5 ℃ ~ Maximum 35 ℃)		
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 Sf = 1.5 (Load type, Operation time, in case that the frequency for normal and reversed rotation is considered)

▶ Corrected load torque Te = Tf × Sf = 1.6 × 1.5 = 2.4 [Nm]

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

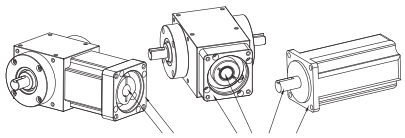
▶ Load O. H. L for output shaft $= \frac{Te \times K \times L}{R} = \frac{24 \times 1 \times 1}{0.4} =$ 6 [N]

3 Selection of model

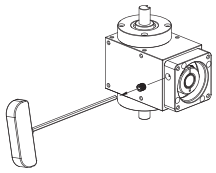
▶ Select a bevel gear box higher than checking model SBT042T that satisfies conditions for use and result values at above 1 and 2 from the specification table (Page 6)

Installation Instructions (In case of M.P Type)

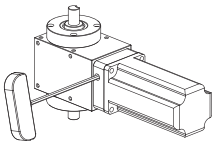
■ Mounting Instructions



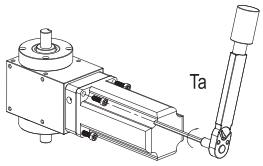
1 Brush away and clean out any foreign substances on the surface after verifying the size of the motor and the gearhead. (Check the shaft diameter. use appropriate bushing if necessary)



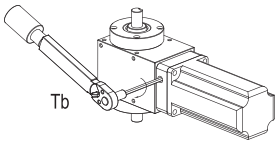
2 Remove the screw plug from the adapter flange and adjust the position so that the clamp bolt is noticeable. (See 「Appendix 1」.)



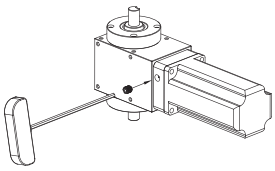
3 When mounting onto the motor, closely adhere the adapter flange of the gearhead and the motor mounting side and slightly tighten the clamping bolt so that the clamp ring not idle.



4 Bolts diagonally tighten based on the standard Ta. (See 「Appendix 2」.)



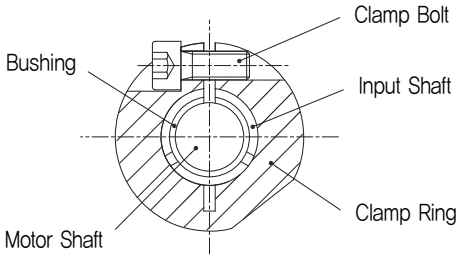
5 Tighten the clamp ring based on the standard Tb. (See 「Appendix 2」.)



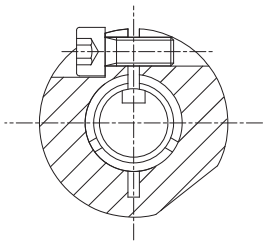
6 Tighten the screw plug.

■ 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.



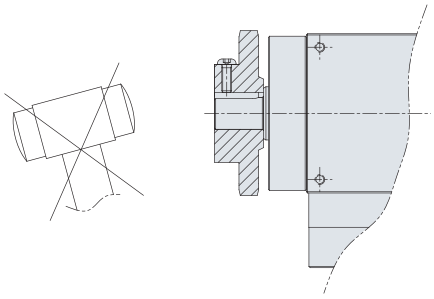
(Figure A) Motor shaft without key



(Figure B) Motor shaft with key

■ 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

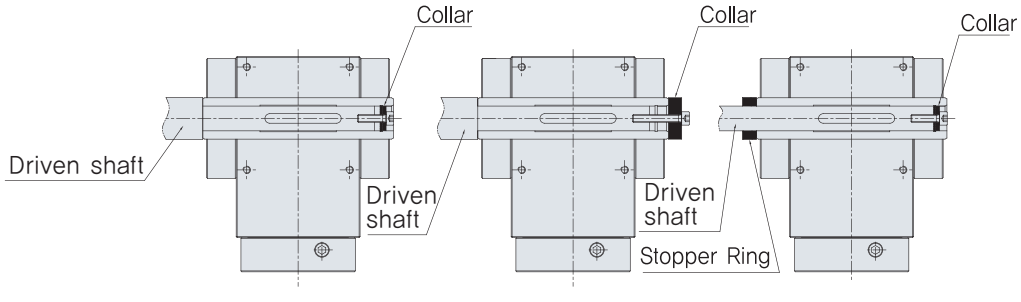
Apply burning prevention agent (MoS2) to the inner diameter of the driven shaft and insert the key into the driven shaft keyway, and then it into the hollow keyway. Tapping the shaft by hammer may cause damage to the inner side of the bearing and the reducer.
The figures below show how to install a driven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



(Figure A) (Figure B) (Figure C)

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, lighting, 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.

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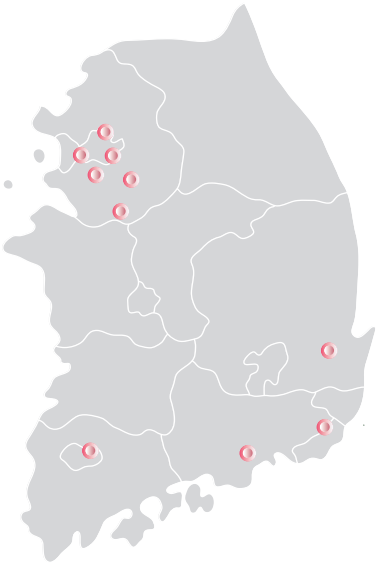

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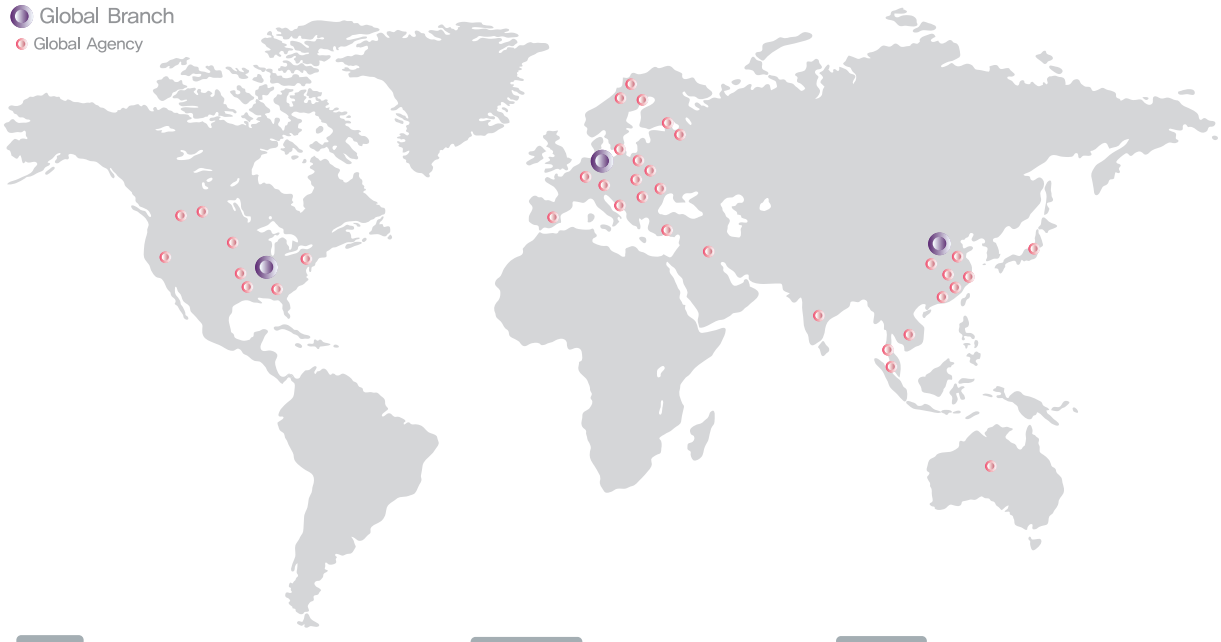

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