



# DRIVE CENTRE

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# GTC



G104-A

## SPEED REDUCERS

### SPEED REDUCER-TORQUE INCREASERS

GNP Planetary Gearhead

WS-GNP Right-Angle Reducer (gearhead)

WS-DS Right-Angle gearbox

Type NT Low Backlash Platform gearbox

Very Low Backlash Ball type Reducers

Very Low Backlash Harmonic Gear Reducers



## Company Introduction

### About us

Gumptious Technology Co. (GTC) is an innovated company specialized in R&D and manufacture of various types of servo gearboxes. Since 2001, GTC has been well positioned to deliver reliable products and services to our customers and partners all over the world with breakthrough patented technologies.

With innovation and passion, we are committed to be your best business partner in the field of gearbox and motion technology

Our company name, Gumptious Technology Co, derives from the word "gumption" -- meaning courage and initiative -- enterprise and willingness to move forward. Therefore, being gumptious enables us to design and manufacture the best technology products for our customers.

### What we provide

GTC provides patented products including the very popular backlash free Ball Reducer , backlash free Right Angle Gearbox(WS series), highly accurate Hollow Rotary Platform Gear Reducer (NT series) and precision Planetary Gearhead (GNP series).

### Why choose us

Through the advanced technology and diverse product portfolio, GTC offers the appropriate solutions to our clients, not only reducing costs but also creating the best value. We are also able to offer customized products to meet diversified needs of our customers. Aesthetics, high quality, safety and efficiency, with the products, GTC helps our customers, vendors, our sales channel and our employees become more successful.

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## Company Introduction

## Products

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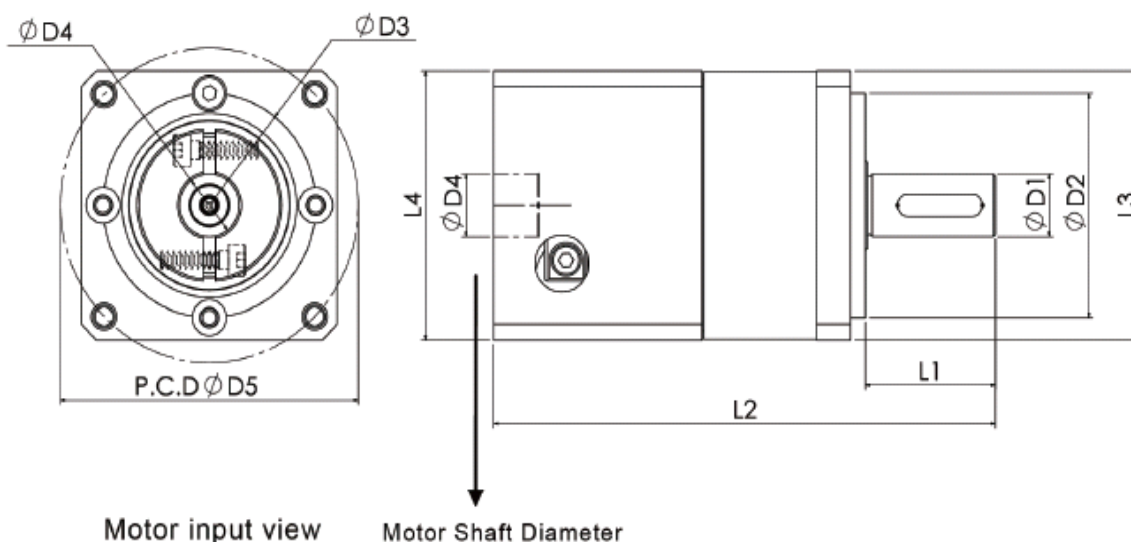
## GNP series

### Low Backlash Planetary Gearheads – In Line

- Flange-style Output Face – can be mounted in your machine from the motor-side.  
Output housing is aluminum. (1)
- Alloy steel output shaft is supported by two deep groove ball bearings for rigidity.
- Alloy steel center ring has accurately machined integral ring gear.
- Hardened and ground planet gears rotate on needle bearings and large hardened shafts.
- Input pinion is outboard supported (not cantilevered) in a ball bearing for rigidity.
- Input coupling has two opposing screws for secure connection to servo motor shaft.
- Motor-input housing is anodized aluminum with a lubrication seal for the input coupling
- Precision backlash of 6 arc-mins max. for 1 stage (except GNP40 size).



5 sizes available



Dimensions -- mm	GNP40	GNP60	GNP90	GNP120	GNP150
$\phi D1$ keyway std.	13	14 (3)	22	32	40
$\phi D2$ standard	35	50	80	110	130
$\phi D3$ (2)	40	60	60-80	80-110	110-130
$\phi D4$ (2)	5~9	6.35~14	11~24	19~35	20~38
$\phi D5$ (2) motor side	63	75	75-100	100-130	130-165
L1 standard	20.50	30.50	38	53	75
L2 one stage	95.50	124.85	146.90	209.70/ 219.70	282
L3 standard	42	60	90	115	142
L4 standard	57	72	92	113/ 130	142

(1) The output housing of size GNP 90 is alloy steel.

(2) Typical—This dimension is machined for user's specified servo motor. Drawings are available in PDF & STEP format upon request.

(3) Option :  $\phi 16$

Performances		Stages	Ratio (1)	GNP40	GNP60	GNP90	GNP120	GNP150
Nominal Output Torque	Lb-in/ Nm	1	3	-	130 /14.7	563/63.7	1127/127.4	2168/245
			4	86.7/9.8	173/19.6	650 /73.5	1301/147	3726/421
			5	95/10.8	182/20.6	693/78.4	1500 /169.5	3903/441
			7	86.7/9.8	164/18.6	607/68.6	1127/127.4	3292/372
			9	-	-	-	1040/117.6	-
			10	77.8/8.8	147/16.7	520/58.8	693/78.4	2425/274
		2	9	77.8/8.8 to 95/10.8	130/ 14.7 to 182/20.6	520/ 58.8 to 693/78.4	693/78.4 to 1500/169.5	2168/245 to 3903/441
			12					
			15					
			16					
			20					
			21	Depends Upon Ratio	Depends Upon Ratio	Depends Upon Ratio	Depends Upon Ratio	Depends Upon Ratio
			25					
			28					
			30					
			35					
			40					
			49					
			50					
			70					
			100					
Max Acceleration Torque	Lb-in/ Nm	1,2	3~100	3 times Nominal Output Torque				
Emergency Stop Torque (2)	Lb-in/ Nm	1,2	3~100	3.4 times Nominal Output Torque				
Permissible Input Speed (3)	rpm	1,2	3~100	3000	3000	3000	3000	3000
Standard Backlash (Max.)	Arc-mins	1	3~10	20	5	5	6	6
		2	9~100	30	10	9	11	11
Max. radial force (mid shaft)	Lbf/ N	1,2	3~100	154 / 686	242 / 1078	777 / 3459	1024 / 4557	1378 / 6134
Max. axial force	Lbf/ N	1,2	3~100	77 / 343	124 / 539	386 / 1729	512 / 2278	669 / 3067
Allowable Input Shaft Diameter	mm	1	3~10	5~9	6.35~14	11~24	19~35	20~38
Rated life (4)	H	1,2	3~100	> 10,000				
Operating Temperature Range	°C	1,2	3~100	-10°C to +40°C ambient    --    90°C max operating case temperature				
Sound level	dB (A)	1	3~10	62	62	65	65	70
		2	9~100	62	62	65	65	65
Lubrication		1,2	3~100	Lubricated for life (Synthetic Grease)				
Protection class		1,2	3~100	IP54				
Gearhead Inertia	kg-cm²	1	3~10	0.049	0.127	1.247	2.274	10.19
		2	9~100	0.049	0.127	1.247	1.247	2.274
Efficiency at full load	%	1,2	3~100	95 % for 1 stage and 90 % for 2 stage				
Weight	Kg	1	3~10	0.4	1.1	3.3	6.8	13.8
		2	9~100	0.5	1.3	4.5	8.3	14
No-load running torque	Lb-in/ Nm	1	3~10	0.44 / 0.05	2.3/0.3	5.3/0.6	10.7/1.2	12.8/1.45
		2	9~100	0.43 / 0.05	2.3/0.3	5.3/0.6	5.3/0.6	10.7/1.2

(1) Please contact GTC for 3 stage ratios (2) For 1000 times max during life of gearhead.

(3) For input speeds above 3000 rpm, please consult us, with application details

(4) At permissible input speed and Nominal Output Torque

We modify our standard gearboxes for customer requirements. Please inquire.

**How to Order**—Specify GNP size & ratio. Provide motor face dimensions.

## WS series -- Right Angle

### Unique and Versatile Features Includes planetary In-line Input

Arguably the easiest Right-Angle gearhead on the market to geometrically integrate into your machine. Rectangular “cube-like” geometry provides for easy fitting into your device. With 5 mounting surfaces, other components can be attached to the WS.



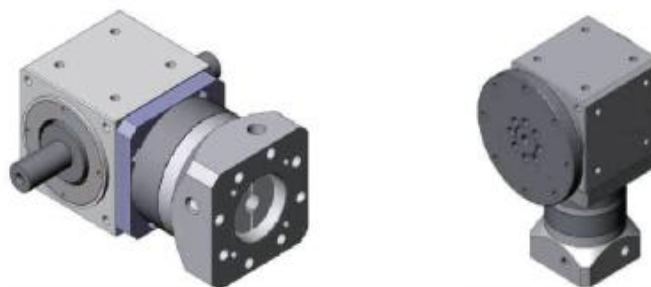
The standard WS output “cube” contains a precision Spiral Bevel Right-Angle gear-set of output ratio 1/1 or 2/1. Backlash as low as 1 Arc-min is available. The input portion to the WS “cube” (x-axis) is an integrated type GNP in-line planetary gearhead (as shown above). Your x-axis servo motor fastens into the Planetary portion via a precision 2-screw balanced coupling. A variety of y-axis outputs are available.

Six standard WS sizes are offered. A wide range of ratios are possible. For example, a 30 to 1 planetary ratio into the WS70F results in an overall ratio of 60 to 1.

Moreover, Right - Angle gearboxes with Spiral Bevel gearing in their output stages can be backlash adjusted with recommended tools and suggested procedures. Upon request, we will provide information for gearbox owners to adjust backlash or tightness at their own risk.

All 6 sizes are available with solid output shaft. However, for the 5 larger gearheads, the WS-F baseline standard is “Hollow”, y-axis, output shaft. Other options are available:

- Double “solid shaft” (y-axis) extensions
- Output shafts in both y and z axes.
- “Stand-alone” gearboxes (Type WS-DS) with solid shaft input and hollow or solid shaft output.
- Gearboxes with a rotating faceplate instead of a shaft.



**Application Notes:** -Output Y- axis is mounted on angular contact ball bearings. Very quiet and smooth power transmission. The customer’s solid output shaft should completely occupy the length of the “hollow” Y- axis.

Radial load caused deflection of the customer’s solid output shaft (installed in the hollow bore, from the face of the coupling, along the theoretical centerline of the shaft) should not exceed 0.5 degree.

Eccentricity of the customer’s solid output shaft installed in the hollow bore should not exceed 0.03 mm T.I.R.



## Performance Characteristics

WS gearhead Type (1) (3)		WS42SF <sup>(2)</sup>		WS70F		WS90F		WS120F		WS150F		WS180F	
includes In-Line input type		- GNP40		- GNP60		- GNP90		- GNP120		- GNP120		- GNP150	
Nominal Output Torque	Lb-in /Nm	51.3 / 5.8		130 / 14.7		243 / 27.5		503 / 56.8		1154 / 130		1735 / 196	
Max Acceleration Torque	Lb-in /Nm	3 Times Nominal Output Torque											
Emergency Stop Torque	Lb-in /Nm	3.4 times Nominal Output Torque-   Maximum of 1000 times during life of gearhead.											
Max input /output Speed	rpm	1500 / 1500		3000 / 600		3000 / 500		3000 / 400		3000 / 400		3000 / 250	
Gear ratio (2) (4)	L	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2	L1	L2
Standard Backlash (max) (5)	Arc-mins	6	8	3	5	3	5	3	5	3	5	3	5
Reduced Backlash (max) (5)	Arc-mins	-	-	1	3	1	3	1	3	1	3	1	3
Max. radial load (6)	Lbf/ N	55 / 245		190 / 843		309/ 1373		551 / 2452		772 / 3432		1213 / 5394	
Max. axial force	Lbf/ N	27 / 122		94 / 422		154 / 686		275 / 1226		386 / 1716		605 / 2697	
Allowable input Shaft Diameter	mm	5~9		6.35~14		11~24		19~35		19~35		20~38	
Rated life	H	> 10,000   - at permissible input speed and Nominal Output Torque											
Operating Temperature Range	°C	-10°C to +40°C ambient   --   90°C max operating case temperature											
Sound level	dB(A)	62	62	65	65	65	65	65	65	70	65	70	65
Mounting Pos & Lubrication		All Positions -- Lubricated for life (synthetic grease)											
Direction of rotation		Motor and gearhead shaft opposite directions											
Protection class		IP54											
Gearhead Inertia	kg - cm <sup>2</sup>	0.049	0.049	0.127	0.127	1.247	1.247	1.247	1.247	2.274	1.247	1.019	2.274
Efficiency at full load	%	85 % for 1 stage and 80 % for 2 stage											
Weight	Kg	1	1.1	2.2	2.5	5.7	6.8	12.5	14.8	17	18.3	52.1	52.8
No-load running torque	Lb-in/Nm	1/0.1	1/0.1	3/0.3	3/0.3	5/0.5	5/0.5	18/2	18/2	18/2	18/2	18/2	18/2

(1) SF suffix indicates solid shaft -- the 42 size is available only with ratio 1 and solid output shaft.

(2) WS42SF ratios -- L1(1stage): 4,5,7,10; L2 (2stage): 12,15,16,20,21,25,28,30,35,40,49,50,70

(3) F suffix indicates Hollow shaft is standard. However, "solid output shaft" and "double output shafts" are regular options.

(4) WS 70 to WS150 ratios -- L1(1stage): 6,8,10,14,20 ; L2 (2stage): 18,24,30,32,40,42,50,56,60,70,80,98,100,140,200

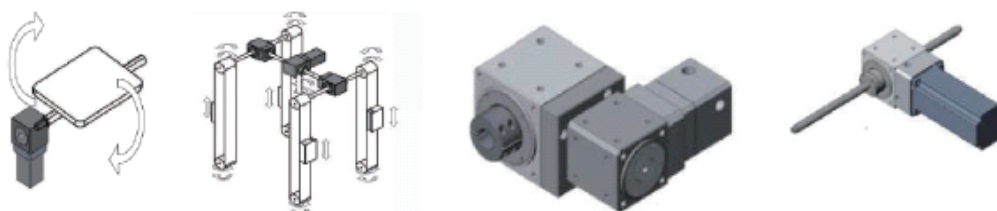
Please inquire for any ratio not shown.

(5) At 3 % of rated load

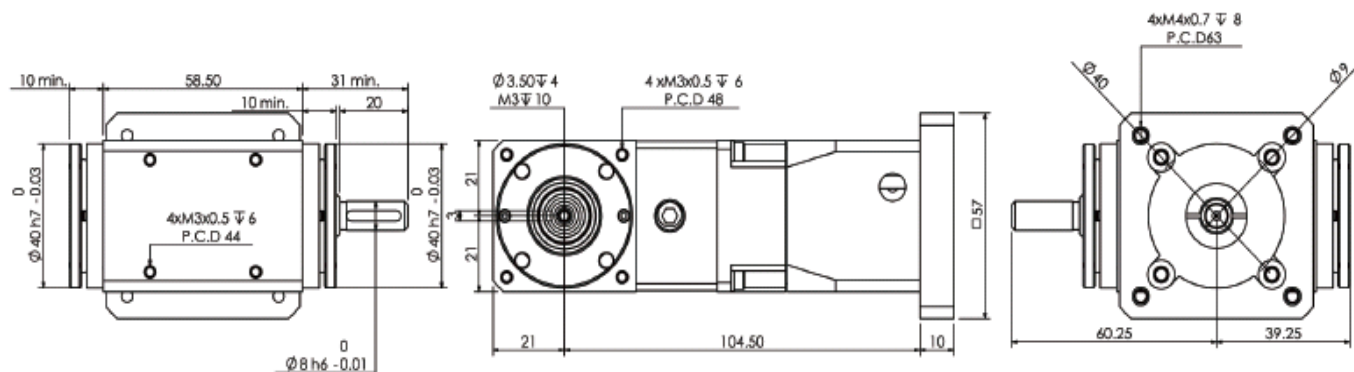
(6) At a distance of one-half of one coupling length -- from end of the coupling

**How to Order – State WS gearhead Type- Size + total ratio + your motor brand and type. Describe output configuration if not standard.**

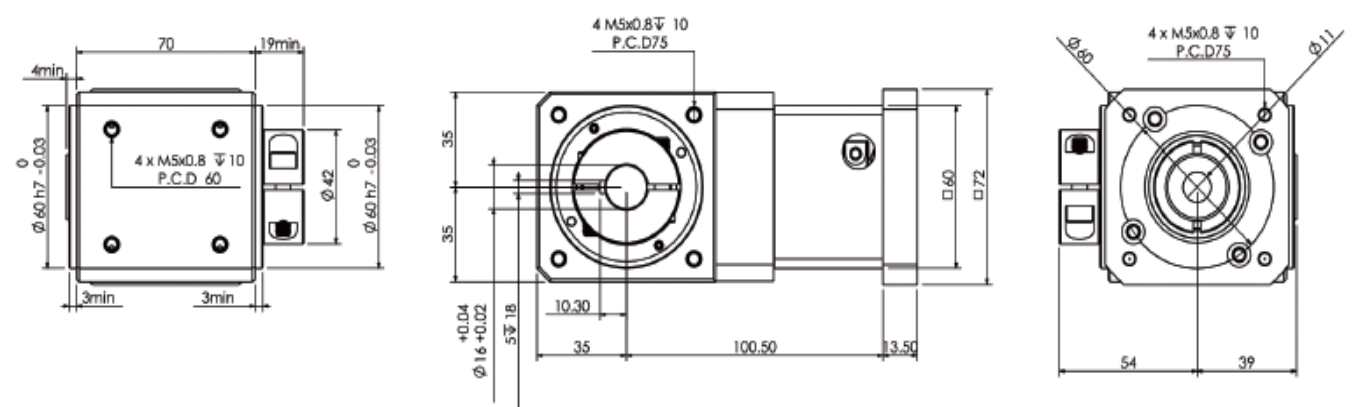
## Some WS Applications:



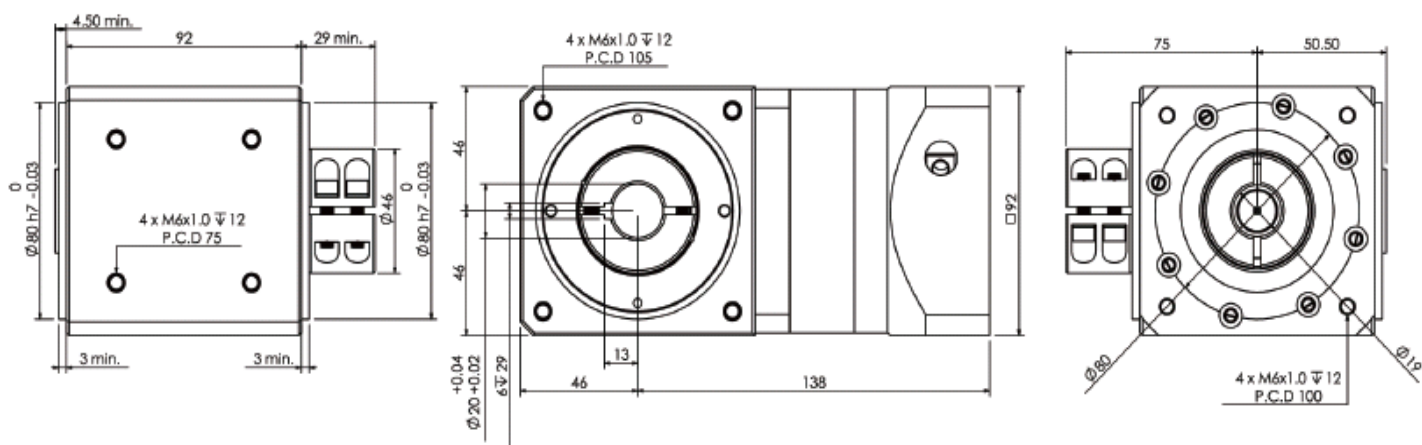
## WS42SF-GNP40



## WS70F-GNP60

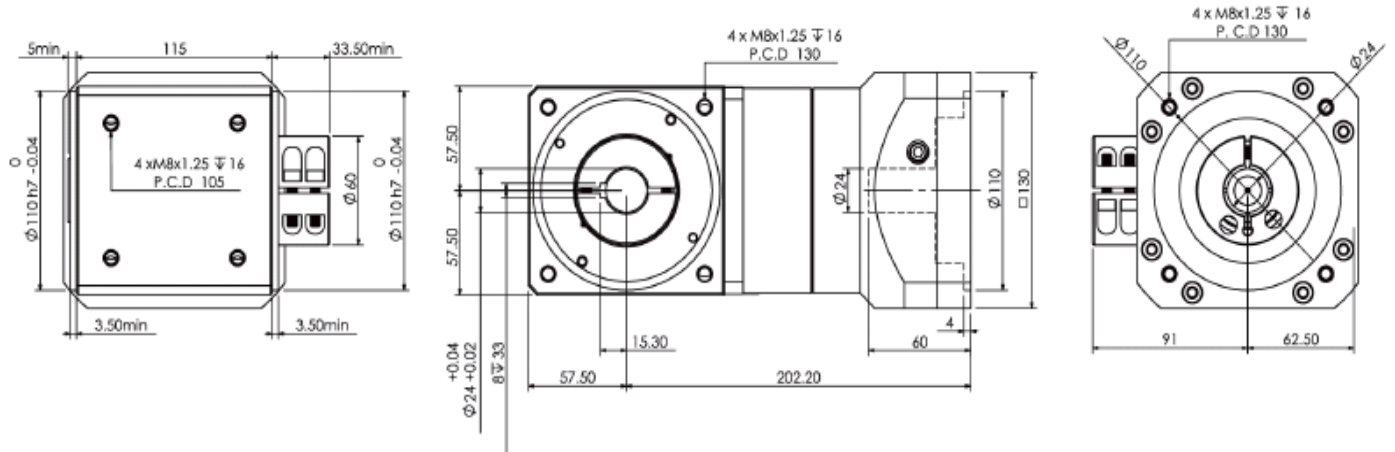


## WS90F-GNP90

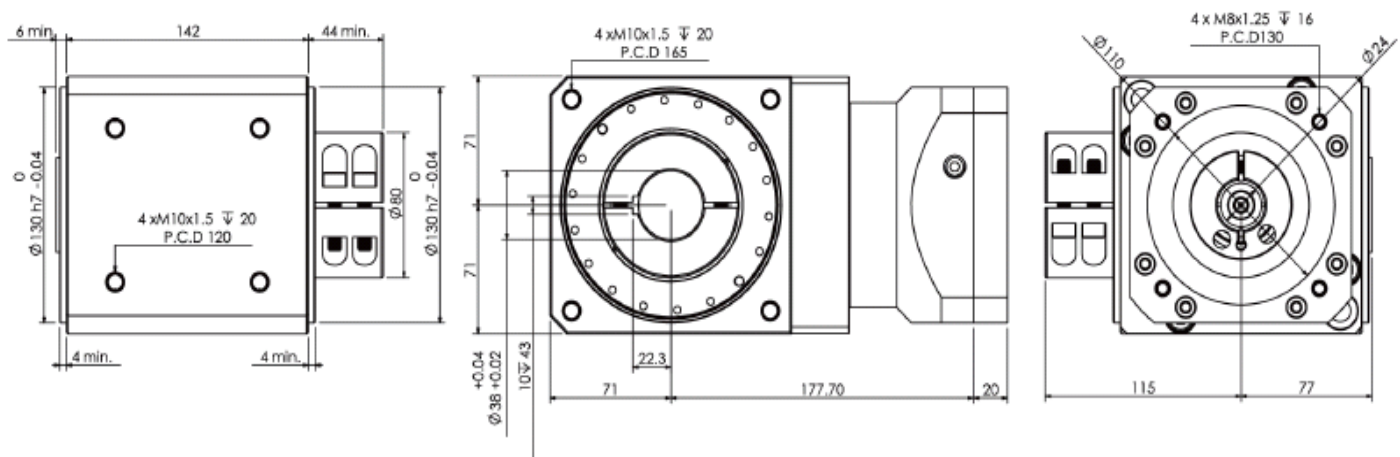




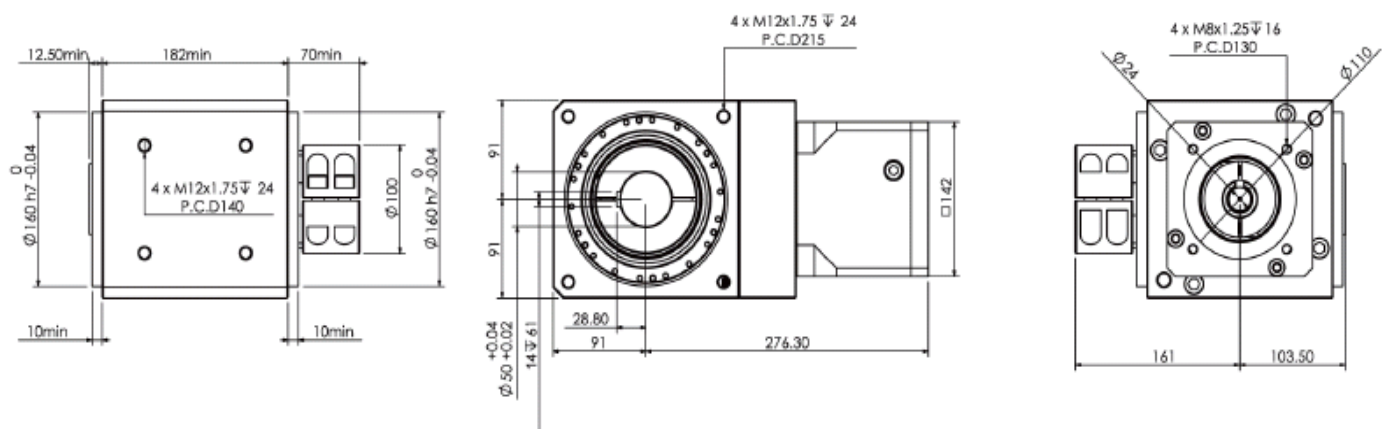
## WS120F- GNP120



## WS150F- GNP120



## WS180F- GNP150



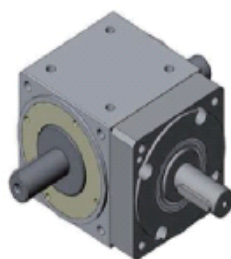
## WS –DS Right-Angle Series

Precision Spiral Bevel gearbox family - 6 sizes  
 Smallest is WS 42SF-1-DS (Single stage, ratio 1) with  
 “solid” shaft X-axis input and solid Y-axis output.  
 5 larger sizes - Sizes 70-180 (Single stage, ratio 2) with  
 “solid” shaft input and hollow shaft output.  
 Other output variations available for Y and Z axis  
 Mount in your machine on any of 6 sides  
 Customize your input and output shaft features  
 Output torques to 1735 Lb-in/ 196 Nm.

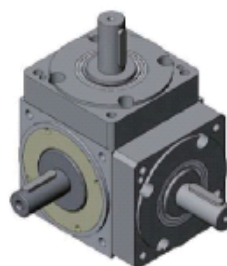


Above -- Typical solid shaft X-axis input  
 with Hollow shaft Y or Z axis output

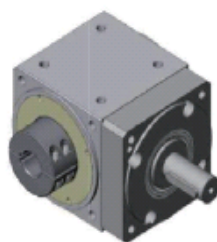
These Right-Angle gearboxes with Spiral Bevel gearing in their output stages can be backlash adjusted with recommended tools and suggested procedures. Upon request, we will provide information for gearbox owners to adjust backlash or tightness at their own risk.



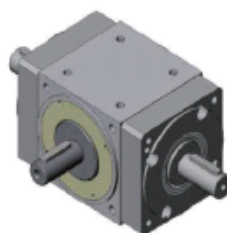
X-axis solid shaft input  
 Y-axis solid double output shafts



X-axis solid shaft input  
 Y and Z axis –solid output shafts



Standard size 70-180 output -- Hollow shaft  
 y- axis output with integrated coupling



X and Y solid output shafts

### Application Notes:

Output Y- axis is mounted on angular contact ball bearings. Very quiet and smooth power transmission.

The customer’s solid output shaft should completely occupy the length of the “hollow” Y- axis.

Radial load caused deflection of the customer’s solid output shaft, installed in the hollow bore, from the face of the coupling, along the theoretical centerline of the shaft, should not exceed 0.5 degree.

Eccentricity of the customer’s solid output shaft installed in the hollow bore should not exceed 0.03 mm T.I.R.

## Performance Characteristics – Solid Input Shaft

WS gearhead Type (1)(2)		WS42SF -1-DS	WS70F -2-DS	WS90F -2-DS	WS120F- 2-DS	WS150F -2-DS	WS180F -2-DS
Nominal Output Torque	Lbf-in / Nm	51.3 / 5.8	130 / 14.7	243 / 27.5	503 / 56.8	1154 / 130	1735 / 196
Max Acceleration Torque	Lbf-in / Nm	3 times Nominal Output Torque					
Emergency Stop Torque	Lbf-in / Nm	3.4 times Nominal Output Torque - Maximum of 1000 times during life of the gearhead.					
Max input /output Speed	rpm	1500 / 1500	1200 / 600	1000 / 500	800 / 400	800 / 400	500 / 250
Gear ratio	i	1	2	2	2	2	2
Standard Backlash (max) (3)	Arc-mins	10	10	10	10	10	10
Reduced Backlash (max) (3)	Arc-mins	5	5	5	5	5	5
Max. radial load (4)	Lbf/ N	55 / 245	190 / 843	309 / 1373	551 / 2452	772 / 3432	1213 / 5394
Max. axial force (Y-axis)	Lbf/ N	27 / 122	94 / 422	154 / 686	275 / 1226	386 / 1716	605 / 2697
Rated life	H	> 10,000 - at permissible input speed and Nominal Output Torque					
Operating Temperature Range	°C	-10°C to +40°C ambient -- 90°C max operating case temperature					
Sound level (5)	dB (A)	65	65	65	72	77	78
Mounting Pos & Lubrication		All Positions -- Lubricated for life (synthetic grease)					
Direction of rotation		Input and output shafts opposite directions					
Protection class		IP54					
Efficiency at full load	%	85%					
Weight	Kg	0.6	1.2	3.4	7.4	13	41
No-load running torque	Lbf-in/ Nm	0.71 / 0.08	2.3 / 0.26	4.25 / 0.48	4.25 / 1.43	17 / 1.91	-
Gearhead Inertia	Kg- cm <sup>2</sup>	0.035	0.05	0.23	0.8	1.72	2.12

(1) SF suffix indicates solid shaft output is standard. The 42 size is available only with solid output shaft and ratio 1.

(2) F suffix indicates Hollow output shaft is standard. Ratio 2 is standard for sizes 70-180.

(3) At 3 % of rated load

(4) At a distance of one-half of the coupling length -- from end of the coupling

(5) At max. input speed and at max standard backlash.

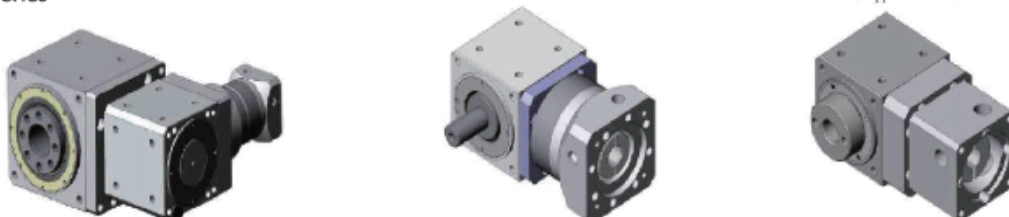
### How to Order – State WS-DS gearhead Type. Describe output configuration desired.

Notes : X axis output is same rpm as X axis input

Y and Z axis outputs have input speed divided by ratio

**Input Alternatives** -- The WS-DS gearbox accommodates a variety of input hardware to solve motion control objectives. Please inquire.

**Larger ratios** -- We can integrate our type GNP planetary gearheads into the input side -- Fixed ratios from 3 to 100 in 1 or 2 stages -- See WS - GNP Series





## NT series -- hollow bore, rotating flange

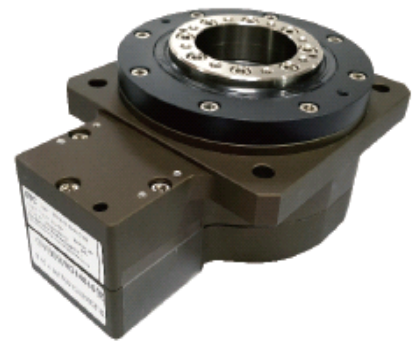
A – Max Backlash of 30 arc-seconds.

B – Large hollow rotary flange – hollow bore for wiring or shafts.

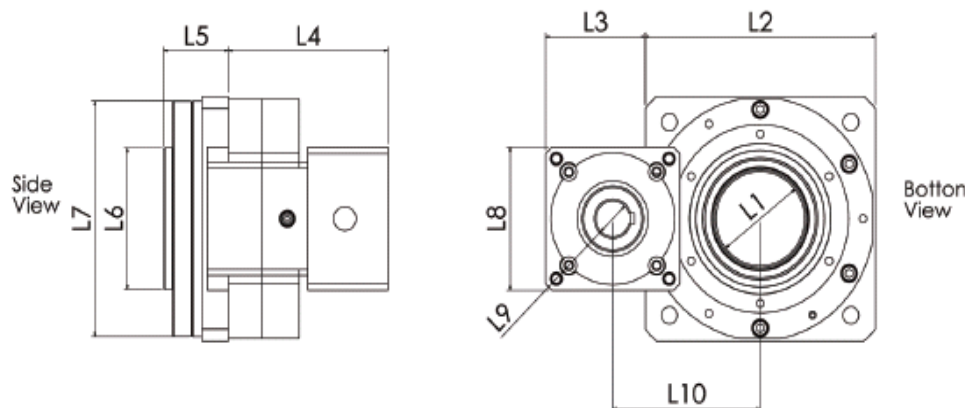
C – Hollow bore driven by your servo motor via large helical ring gear integrated in a rotating flange. Provides smooth, accurate and fast positioning & indexing.

D – Flange rotates on precision high capacity “crossed roller” type bearing for positional accuracy, rigidity and heavy axial loads.

E – Larger reduction ratios achievable by inputting with planetary or right angle gearbox.



Top view shows precision threaded attachment holes in round rotating output



Item	Description (all dimensions in mm)	NT85	NT130	NT230
L1	Diameter of NT gearbox rotating hollow bore	35	50	105
L2	Square of flange for bolting NT gearbox to machine frame – has 4 mounting holes	85	130	235
L3	End of motor mounting housing	42.54	63.29	97.5
L4	Motor mounting housing length from bottom of square flange	55	89	129
L5	Height of rotating output flange from bottom of square flange	23	36.6	60
L6	Diameter of NT rotating flange. Has precision threaded holes in face for fastening of customer features.	56	75	150
L7	Diameter of ring gear housing –does not rotate	80	125	230
L8	Square flange for attachment of power input to NT – a servomotor –alone or with gearhead.	60	76	130
L9	Typical diameter of motor shaft associated with L8	9	11-19	19-24
L10	Center distance - Hollow bore to power input shaft	55.04	83.29	150

The standard dimension diagram contemplates a “stand-alone” servo motor as the power input device. If In-line or right-angle gear ratios are required, we can provide input flanges for our Type GNP or WS gearboxes.

**How to Order:** State NT model desired, and planned input motor or gearmotor. Supply drawing of input device proposed.

## Some NT input alternatives:



Type NT with servo motor input. Could also be a servo motor with an In-Line planetary gear box.



Type NT with input from combined Right-Angle and In-Line planetary gearboxes.



Type NT with input from R-A servo gearbox and a second gearbox arranged to rotate a ball-screw or shaft through the NT hollow bore

Performances		NT85	NT130	NT230
Nominal Output Torque	Lb-in/ Nm	13.0 / 1.47	155 / 17.5	321 / 36.2
Max Acceleration Torque	Lb-in/ Nm	3 times Nominal Output Torque		
Emergency Stop Torque (1)	Lb-in/ Nm	3.4 times Nominal Output Torque		
Permissible Input Speed	rpm	3000	3000	600 (2)
NT Gear ratio (3)	i	30	10	10
Standard Max Backlash	Arc-sec	30	30	30
Max Tilting moment-at flange face	Lb-in/ Nm	88 / 10	440 / 50	880 / 100
Max radial load ( perpendicular to axis)	Lbf/ N	110 / 490	440 / 1961	1840 / 8188
Max. axial force - along rotational axis	Lbf/ N	55 / 245	220 / 980	920 / 4094
Rated life (4)	H	> 10,000		
Operating Temperature Range	°C	-10°C to +40°C ambient -- 90°C max operating case temperature		
Lubrication		Lubricated for Life ( synthetic grease)		
Protection class		IP54		
Gearhead Inertia	Kg- cm <sup>2</sup>	0.02	0.2	2.3
Efficiency at full load	%	80%		
Weight	Kg	1.1	3.8~4.1	13.7
No-load running torque	Lb-in / Nm	0.005 / 0.05	0.05 / 0.5	0.17 / 1.7

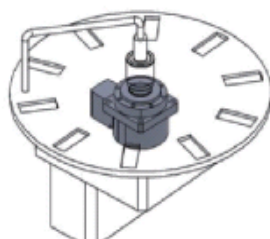
(1) For 1000 times max during life of gearhead

(2) Output limit speed at 60 rpm

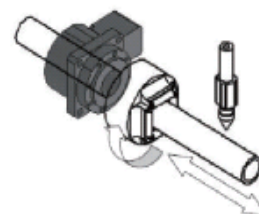
(3) Larger reduction ratios possible by inputting with an In-line or right angle gearhead.

(4) At permissible input speed and Continuous Output Torque

## Some NT Applications:



Index Table with wiring



CNC Laser cutting machine

## Type SBRU Ball Reducer gearbox

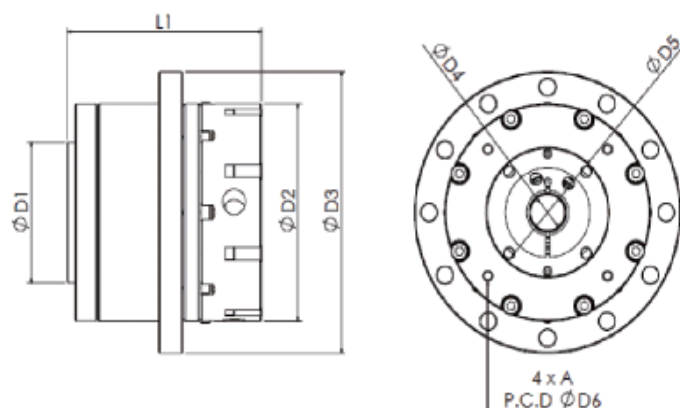
**Technology** – No gears. Speed reduction is due to non-slip, input torque induced, rolling of ball bearings in smooth accurate epicyclic tracks. Principles of operation can be viewed on several websites.

**Standard ratios** – 20 to 50/1 in one stage. In planetary, these ratios would require 2 stages of gearing. Contact us for non-listed ratios.

**Features**—This is our largest diameter rotating flange style reducer. This ball reducer provides inherent low “backlash” of less than ½ arc-min, relative quietness, and high external load carrying ability. Axial body length is shorter than all other reducer types. Specify this reducer for applications requiring smaller max backlash than available in planetary gearboxes of similar size.

This ball reducer can be **“backlash” (tightness) adjusted** with recommended tools and suggested procedures. Upon request, we will provide information for gearbox owners to adjust backlash or tightness at their own risk.

**Application** --The SBRU is designed for horizontal or vertical axis mounting. Standard circular output flange rotates in a “crossed axis” roller bearing for high loads, rigidity and exceptional compactness. A shaft or turntable can be integrated to the output flange. Standard input contemplates your servo motor.



Selected dimensions (mm)	SBRU110	SBRU130	SBRU200
D1 - rotating output flange	55	60	100
D2 – body diameter	85	104	165
D3 – mounting flange dia.	110	130	200
D4 - motor shaft input dia. (max)	14	14	22
D5 –motor pilot	50/ 60	50/ 60	110
D6 - motor square flange holes	70/ 75	70/ 75	145
L1 – overall length	80.25	83.25	91

※Please contact us to verify dimension to fit your motor

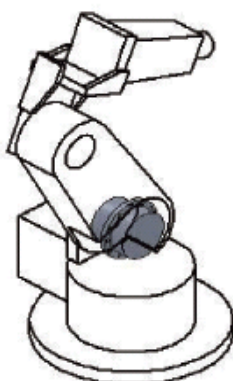


Performances		Ratio	SBRU110	SBRU130	SBRU200
Nominal Output Torque	Lbf-in/ Nm	20	-	254 / 28.7	-
		30	-	185 / 20.9	809 / 91.4
		40	-	217 / 24.5	1249 / 141
		50	170 / 19.2	185 / 20.9	923 / 104
Max Acceleration Torque	Lbf-in/ Nm	20~50	3 times Nominal Output Torque		
Emergency Stop Torque (1)	Lbf-in/ Nm	20~50	3.4 times Nominal Output Torque		
Permissible Input Speed	rpm	20~50	3000	3000	3000
Standard Max Backlash	Arc- sec	20~50	30 arc - secs	30 arc - secs	30 arc - secs
Max Tilting moment-at flange face	Lb-in/ Nm	20~50	88 / 10	177 / 20	440 / 50
Max. radial force	Lbf/ N	20~50	111 / 495	379 / 1684	446 / 1984
Max. axial force	Lbf/ N	20~50	56 / 248	189 / 842	223 / 981
Rated life (3)	H	20~50	> 10,000		
Operating Temperature Range	°C	20~50	-10°C to +40°C ambient -- 90°C max operating case temperature		
Sound level	dB(A)	20~50	60	61	62
Lubrication		20~50	Lubricated for life (Synthetic Grease)		
Protection class		20~50	IP54		
Gearhead Inertia	kg-cm <sup>2</sup>	20~50	0.42	0.56	0.26
Rigidity	Kgf*m/arc min	20-50	0.224	0.45	1.23
Weight	Kg	20-50	2.5	4.3	12.65
Min no-load torque to rotate (2)	Lbf-in/ Nm	20~50	2.3 / 0.25	2.8 / 0.31	7.8 / 0.88

- (1) For 1000 times max during life of gearhead
- (2) At 3000 rpm and 20 °C case temperature
- (3) At permissible input speed and Nominal Output Torque
- (4) Nominal efficiency is 85% at full rated load
- (5) All position mounting

**How to Order** – state SBRU size and ratio. Provide torque, speed, and dimensions of your motor. We provide selection assistance and suggestions upon request.

### Typical SBRU Application:



6 Axis Robot

## Type SBDE Ball Reducer gearbox

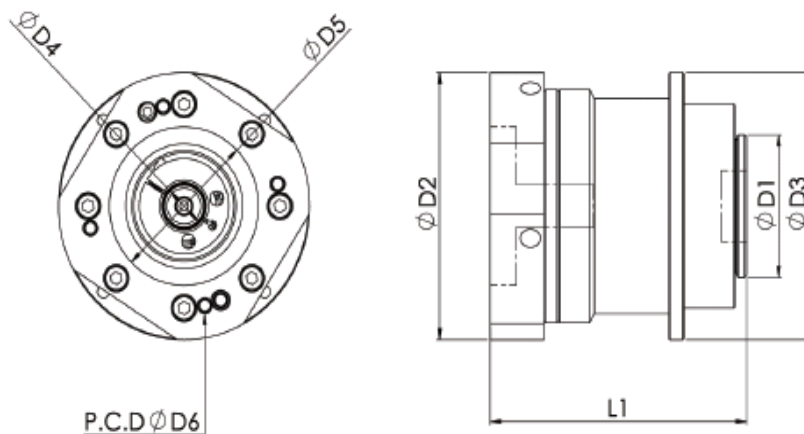
**Technology** – No gears. Speed reduction is due to non-slip, input torque induced, rolling of ball bearings in smooth accurate epicyclic tracks. Principles of operation can be viewed on several websites.

**Standard ratios** – 10 to 50/1 in one stage. In planetary, ratios greater than 10 would require 2 stages of gearing. Contact us for non-listed ratios.

**Features**-- This is our smallest diameter rotating flange style gearhead. Compared to planetary gear reducers of similar diameter and torque rating, this ball reducer features inherent low backlash of less than ½ arc-min. and relative quietness. The standard rotating flange style output is popular for turntable or (disk shaped) loads.

This ball reducer can be **“backlash” (tightness) adjusted** with recommended tools and suggested procedures. Upon request, we will provide information for gearbox owners to adjust backlash or tightness at their own risk.

**Application** –The output flange rotates on deep groove ball bearings. Standard input contemplates your servo motor. Clamp style input coupling. For higher torque and axial load capability, see our SBRU ball reducer series.



Selected dimensions (mm)	SBDE50	SBDE70	SBDE90
D1 - rotating output flange	28	40	63
D2 – body diameter	47	70	118
D3 – mounting flange dia.	72	86	118
D4 - motor shaft input dia. (max)	8	14	19
D5 –motor pilot	30	50	70
D6 - motor attachment holes	46	70	90
L1 – overall length	79	98.8	120.1

※Please contact us to verify dimension to fit your motor

Performances		Ratio	SBDE50	SBDE70	SBDE90
Nominal Output Torque	Lb-in/Nm	10	124 / 14.01	279.24 / 31.55	346.94 / 39.2
		15	-	183.03 / 20.68	241.09 / 27.24
		20	-	136.21 / 15.39	340.84 / 38.51
		30	100.63 / 11.37	189.93 / 21.46	156.12 / 17.64
		40	-	142.23 / 16.07	249.76 / 28.22
		50	-	-	300.92 / 34
Max Acceleration Torque	Lb-in/Nm	10~50	3 Times of Nominal Output Torque		
Emergency Stop Torque (1)	Lb-in/Nm	10~50	3.4 times of Nominal Output Torque		
Permissible Input Speed	rpm	10~50	3000	3000	3000
Standard Backlash	Arc-sec	10~50	30	30	30
Max. radial force	Lbf/ N	10~50	55 / 245	88 / 392	238 / 1058
Max. axial force	Lbf/ N	10~50	27 / 122	44 / 196	119 / 529
Input Shaft Diameter	mm	10~50	8	14	14~19
Rated life (2)	H	10~50	> 10,000		
Operating Temperature Range	°C	10~50	-10°C to +40°C ambient -- 90°C max operating case temperature		
Sound level	dB (A)	10~50	59	61	63
Lubrication		10~50	Lubricated for life		
Protection class		10~50	IP54		
Gearhead Inertia	kg-cm <sup>2</sup>	10~50	0.06	0.14	0.92
Weight	Kg	10~50	0.46	3.4	4.3
Min no-load torque to rotate	Lbf-in/ Nm	10~50	0.9 / 0.1	2.2 / 0.25	4.7 / 0.53

- (1) For 1000 times max during life of gearhead  
(2) At permissible input speed and Nominal Output Torque  
(3) Nominal efficiency is 85% at full rated load  
(4) All position mounting

**How to Order** – state SBDE size and ratio. Provide torque, speed, and dimensions of your motor.  
We provide selection assistance and suggestions upon request.



## Type SBEE Ball Reducer gearbox

**Technology** – No gears. Speed reduction is due to non-slip, input torque induced, rolling of ball bearings in smooth accurate epicyclic tracks. Principles of operation can be viewed on several websites.

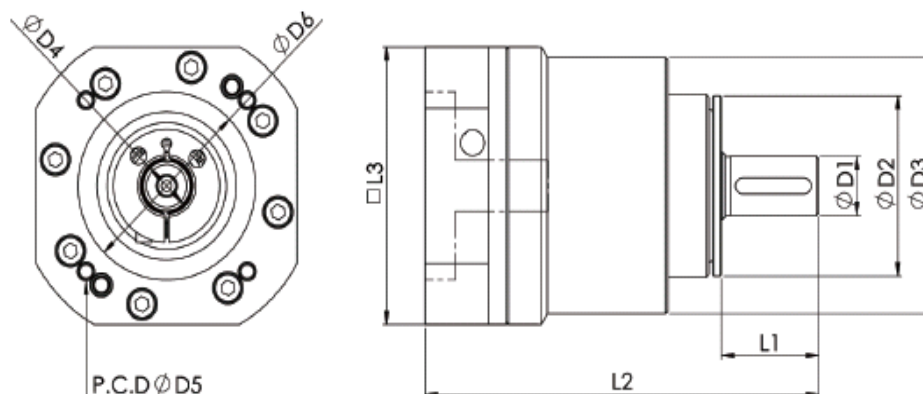
**Standard ratios** – 10 to 50/1 in one stage. In planetary, ratios greater than 10 would require 2 stages of gearing. Contact us for non-listed ratios.

**Features**-- Compared to planetary gearboxes of similar diameter or torque rating, this type of reducer is shorter and features inherent low backlash of less than 1 arc-min with relative quietness.



This ball reducer can be **“backlash” (tightness) adjusted** with recommended tools and suggested procedures. Upon request, we will provide information for gearbox owners to adjust backlash or tightness at their own risk.

**Application** --The SBEE is designed for demanding applications requiring close to zero backlash and an output shaft. Output face has an extra-long precision pilot and fastens via threaded holes in the output flange face (outside the pilot diameter). Standard input contemplates your servo motor.



Selected dimensions (mm)	SBEE50	SBEE70	SBEE90	SBEE120
$\phi$ D1 output shaft dia.	12	16	22	32
$\phi$ D2 output pilot dia.	35	52	68	90
$\phi$ D3 output flange dia.	50	70	95	120
$\phi$ D4 typical input shaft dia	8	14	19	24
$\phi$ D5 typ. input motor B-C	46	70	90	145
$\phi$ D6 typ. input motor pilot	30	50	70	110
L1 output shaft length	20.5	29.5	38.5	52.5
L2 Reducer total length	97.6	137.8	155.5	215
$\square$ L3 Motor input side square	52	70	103	130

※ Please contact us to verify dimension to fit your motor

Performances		Ratio	SBEE50	SBEE70	SBEE90	SBEE120
Nominal Output Torque	Lb-in/ Nm	10	124 / 14	279 / 31.6	347 / 39.2	521 / 58.8
		15	-	183 / 20.7	241 / 27.2	492 / 55.6
		20	-	136 / 15.4	341 / 38.51	366 / 41.3
		30	101 / 11.4	190 / 21.5	156 / 17.6	424 / 48
		40	-	142 / 16.1	250 / 28.2	357 / 40.3
		50	-	-	301 / 34	313 / 35.4
Max Acceleration Torque	Lb-in/ Nm	10~50	3 Times Nominal Output Torque			
Emergency Stop Torque (1)	Lb-in/ Nm	10~50	3.4 Times Nominal Output Torque			
Permissible Input Speed	rpm	10~50	3000	3000	3000	3000
Standard max backlash	Arc- sec	10~50	30 arc - secs	30 arc - secs	30 arc - secs	30 arc - secs
Max. radial force	Lbf/ N	10~50	44 / 196	88 / 392	176 / 784	242 / 1078
Max. axial force	Lbf/ N	10~50	22 / 98	44 / 196	88 / 392	141 / 539
Input Shaft Diameter	mm	10~50	8	14	14~19	19~24
Rated life (2)	H	10~50	> 10,000			
Operating Temperature Range	°C	10~50	-10°C to +40°C ambient -- 90°C max operating case temperature			
Sound level	dB (A)	10~50	59	61	63	64
Lubrication		10~50	Lubricated for life (Synthetic Grease)			
Protection class		10~50	IP54			
Gearhead Inertia	Kg- cm <sup>2</sup>	10~50	0.06	0.14	0.92	2.15
Weight	Kg	10~50	0.46	3.4	4.3	10
Min no-load torque to rotate	Lbf-in/ Nm	10~50	0.9 / 0.1	2.2 / 0.25	4.7 / 0.53	8 / 0.9

- (1) For 1000 times max during life of gearhead  
(2) At permissible input speed and Nominal Output Torque  
(3) Nominal efficiency is 85% at full rated load  
(4) All-position mounting.

**How to order** – Specify SBEE size and ratio. Provide motor torque and dimensions. We offer selection assistance and suggestions.

## Type SBPE Ball Reducer gearbox

**Technology** – No gears. Speed reduction is due to non-slip, input torque induced, rolling of ball bearings in smooth accurate epicyclic tracks. Principles of operation can be viewed on several websites.

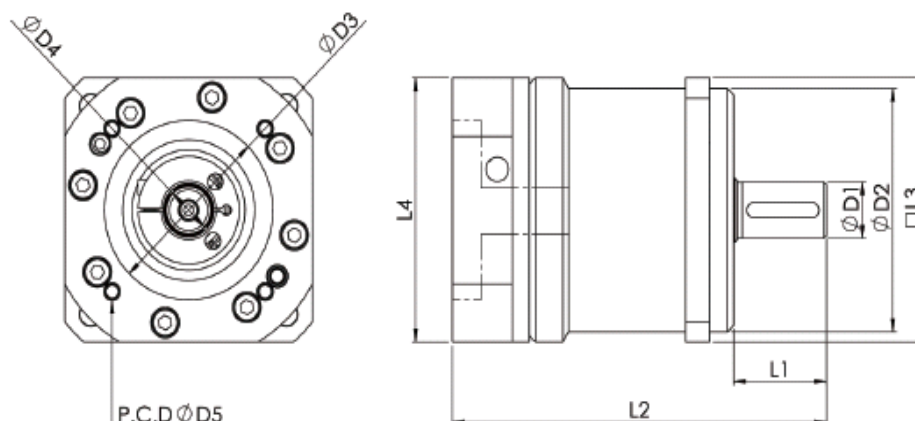
**Standard ratios** – 10 to 50/1 in one stage. In planetary, ratios greater than 10 would require 2 stages of gearing. Contact us for non-listed ratios.

**Features**-- Compared to planetary gearboxes of similar diameter or torque rating, this type of reducer is shorter and features inherent low backlash of less than 1 arc-min with relative quietness.



This ball reducer can be “**backlash**” (**tightness**) **adjusted** with recommended tools and suggested procedures. Upon request, we will provide information for gearbox owners to adjust backlash or tightness at their own risk.

**Application** --The SBPE is designed for demanding applications requiring close to zero backlash and an output shaft. Output face mounts via 4 through mounting holes in a square flange with short pilot diameter. Standard input contemplates your servo motor.



Selected dimensions (mm)	SBPE50	SBPE70	SBPE90	SBPE120
$\phi$ D1 output shaft dia.	12	16	22	32
$\phi$ D2 output pilot dia.	51	70	95	110
$\phi$ D3 typ. input motor pilot	30	50	70	110
$\phi$ D4 typical motor input shaft dia	8	14	14 - 19	19 - 24
$\phi$ D5 typ. input motor B-C	46	70	90	145
L1 output shaft length	20.5	29.5	38.5	52.5
L2 Reducer total length	97.6	137.8	155.5	215
$\square$ L3 output flange square	51	80	103	110
$\square$ L4 Motor input side square	52	70	103	130

※ Please contact us to verify dimension to fit your motor



Performances		Ratio	SBPE50	SBPE70	SBPE90	SBPE120
Nominal Output Torque	Lb-in/ Nm	10	124 / 14	279 / 31.6	347 / 39.2	521 / 58.8
		15	-	183 / 20.7	241 / 27.2	492 / 55.6
		20	-	136 / 15.4	341 / 38.51	366 / 41.3
		30	101 / 11.4	190 / 21.5	156 / 17.6	424 / 48
		40	-	142 / 16.1	250 / 28.2	357 / 40.3
		50	-	-	301 / 34	313 / 35.4
Max Acceleration Torque	Lb-in/ Nm	10~50	3 times Nominal Output Torque			
Emergency Stop Torque (1)	Lb-in/ Nm	10~50	3.4 times Nominal Output Torque			
Permissible Input Speed	rpm	10~50	3000	3000	3000	
Standard max Backlash	Arc-secs	10~50	30 arc - secs	30 arc - secs	30 arc - secs	30 arc - secs
Max. radial force	Lbf/ N	10~50	44 / 196	88 / 392	176 / 784	242 / 1078
Max. axial force	Lbf/ N	10~50	22 / 98	44 / 196	88 / 392	141 / 539
Input Shaft Diameter	mm	10~50	8	14	14~19	19~24
Rated life (2)	H	10~50	> 10,000			
Operating Temperature Range	°C	10~50	-10°C to +40°C ambient -- 90°C max operating case temperature			
Sound level	dB (A)	10~50	59	61	63	64
Lubrication		10~50	Lubricated for life			
Protection class		10~50	IP54			
Gearhead Inertia	Kg- cm <sup>2</sup>	10~50	0.06	0.14	0.92	2.15
Weight	Kg	10~50	0.46	3.4	4.3	10
Min no-load torque to rotate	Lbf-in/ Nm	10~50	0.9 / 0.1	2.2 / 0.25	4.7 / 0.53	8 / 0.9

(1) For 1000 times max during life of gearhead

(2) At permissible input speed and Nominal Output Torque

(3) Nominal efficiency is 85% at full rated load

(4) All-position mounting.

**How to order** – Specify SBEE size and ratio. Provide motor torque and dimensions. We offer selection assistance and suggestions.

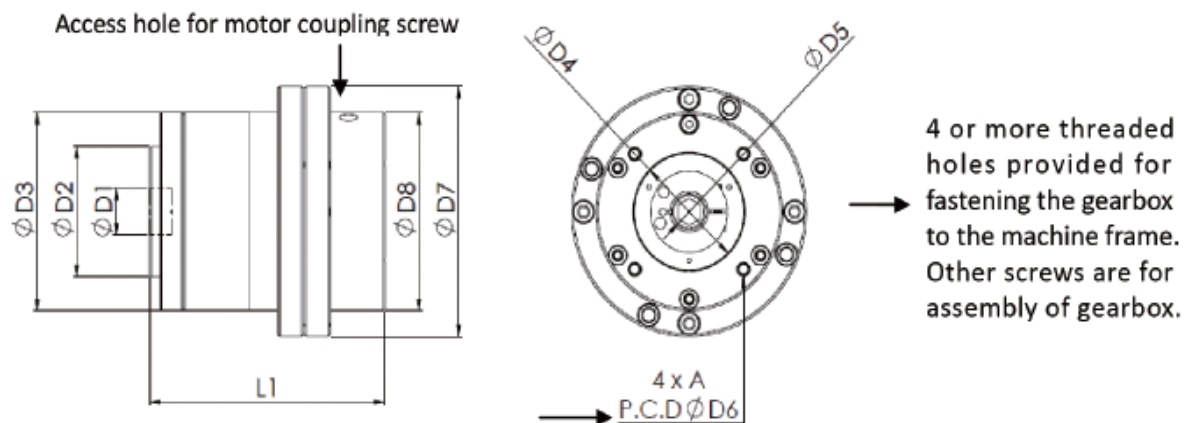
## Type SW1RU- harmonic gearbox

**Technology** – Classified as “strain-wave” gearing and popularly called “harmonic” gearing – Principles of operation can be found on many websites.

**Standard ratios** – 80 to 200/1 in one stage. In planetary, these ratios would require 2 and 3 stages of gearing.

**Features**-- Compared to planetary gearboxes of similar diameter and torque rating, this type of gearing has fewer moving parts, backlash of less than ½ arc-min, quieter, and shorter axial length. Cost can be 30% or more than planetary, depending upon ratio and other construction features.

**Application** --The SW1RU is designed for horizontal or vertical mounting. Standard output is a circular flange, with threaded holes, rotating on a large “crossed axis” roller bearing. A shaft or turntable can be attached to the output flange. Standard input contemplates a servo motor.



Dimension (mm)	SW1RU64	SW1RU76	SW1RU86	SW1RU107	SW1RU138	SW1RU165	SW1RU226
D1- output pilot bore	10	12	16	20	30	32	40
D2 – rotating output flange	24	30	38	56	80	96	135
D3 – output body dia.	50	60	70	85	112	137	186
D4 – motor pilot (typical)	30	30	30	50	70	70	110
D5 – motor input shaft (typ)	8	8	8	14	19	19	22-24
D6 – motor flange mtg holes	46	46	46	70	90	90	145
D7 – dia of housing flange	64	76	86	107	138	165	226
D8 – input hub diameter.	52	60	70	85	112	132	175
L1 - overall length	69	74.5	91.5	107.2	130	160.5	202

Performances		Ratio	SW1RU6 4	SW1RU7 6	SW1RU8 6	SW1RU1 07	SW1RU1 38	SW1RU1 65	SW1RU 226
Nominal Output Torque	Lb-in/ Nm	80	53/6	103/12	222/25	354/40	885/100	1770/200	3186/360
		100	-	133/15	267/30	443/50	1062/120	2124/240	3983/450
		120	-	-	-	443/50	-	-	3983/450
		135	-	-	-	-	1062/120	-	-
		150	-	-	-	443/50	-	-	3983/450
		160	-	-	-	443/50	1062/120	2124/240	3983/450
		200	-	-	-	443/50	1062/120	2124/240	3983/450
Max Acceleration Torque	Lb-in/ Nm	80~200	3 Times Nominal Output Torque						
Emergency Stop Torque	Lb-in/ Nm	80~100	(1) 3.4 times Nominal Output Torque						
Permissible Input Speed	rpm	80~200	3000	3000	3000	3000	3000	3000	3000
Max Backlash	arc-sec	80~200	30	30	30	30	30	30	30
Max Tilting moment-at flange face	Lb-in/ Nm	80~200	44/5	53/6	70/8	88/10	440/50	530/60	619/70
Max. radial force	Lbf/ N	80~200	77 / 343	88 / 392	165 / 735	110 / 490	441/1961	661/2940	765 / 3402
Max. axial force	Lbf/ N	80~200	38 / 171	44 / 196	82 / 367	55 / 245	220/980	330/1470	382 / 1701
Rated life (2)	H	80~200	> 10,000						
Operating Temperature Range	°C	80~200	-10°C to +40°C ambient -- 90°C max operating case temperature						
Sound level (3)	dB(A)	80~200	52	52	52	53	55	62	70
Lubrication		80~200	Lubricated for life (synthetic grease)						
Protection class		80~200	IP54						
Gearhead Inertia	Kg- cm <sup>2</sup>	80~200	0.04	0.14	0.54	1.3	4.2	9.6	22.5
Rigidity	Kgf- m/ arc-min	80~200	0.024	0.060	0.121	0.226	0.538	0.97	1.89
Weight	Kg	80~200	0.7	1.0	1.5	2.7	5.6	12	27.9
No-load running torque	Lb-in/ Nm	80~200	0.6/0.07	0.6/0.07	0.6/0.07	1.2/0.13	2.2/0.25	4.16/0.47	8.4/0.95

- (1) For 1000 times max during life of gearhead  
(2) At permissible input speed and Continuous Output Torque  
(3) At input speed of 1000 rpm  
(4) Efficiency = 85% at permissible input speed and full load

**How to order – State reducer type and size. Provide details of your ratings and dimensions. We offer selection assistance and suggestions.**

**Note: We reserve the right to make technical changes or modify the contents of this document without prior notice. With regard to purchase orders, the agreed particulars shall prevail. We do not accept any responsibility whatsoever for potential errors or possible lack of information in this document.**

**For critical dimensions, request drawing prior to Purchase Order.**





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