

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.



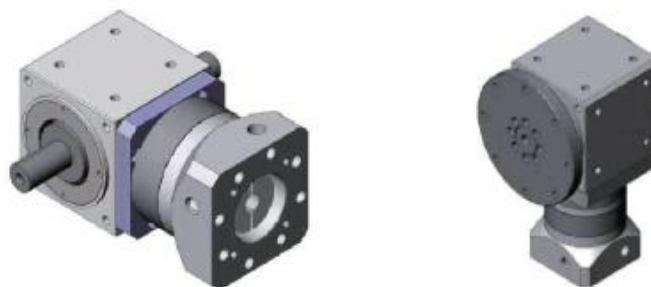
The standard WS output “cube” contains a precision Spiral Bevel Right-Angle gear-set of output ratio 1/1 or 2/1. Backlash as low as 1 Arc-min is available. The input portion to the WS “cube” (x-axis) is an integrated type GNP in-line planetary gearhead (as shown above). Your x-axis servo motor fastens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

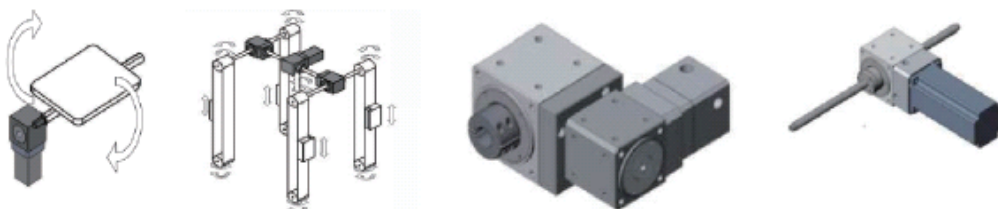
Please inquire for any ratio not shown.

(5) At 3 % of rated load

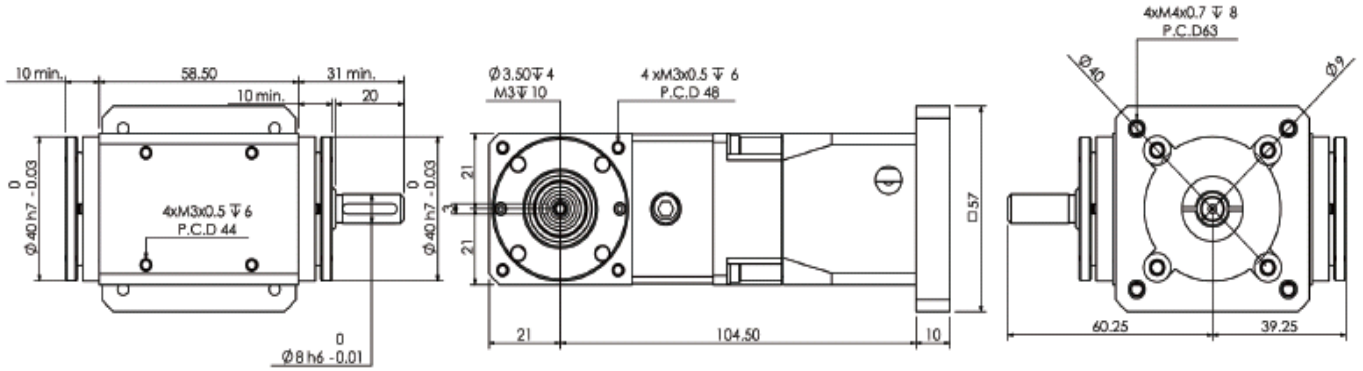
(6) At a distance of one-half of one coupling length -- from end of the coupling

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

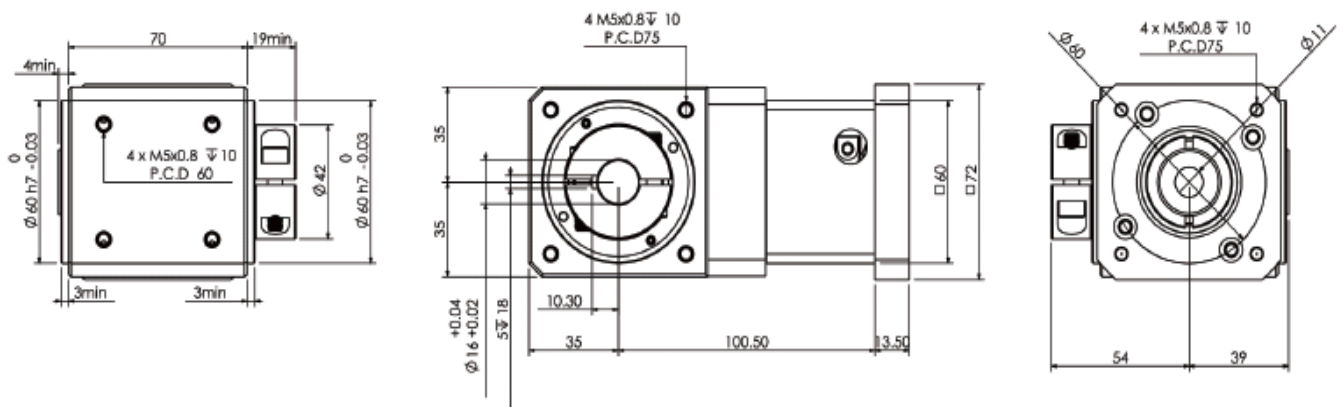
Some WS Applications:



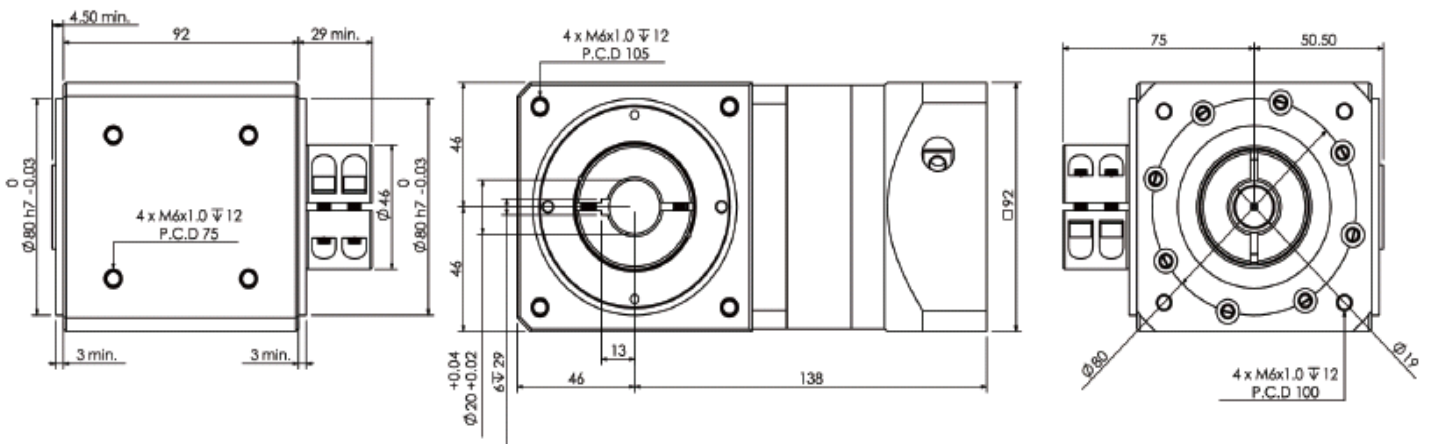
WS42SF-GNP40



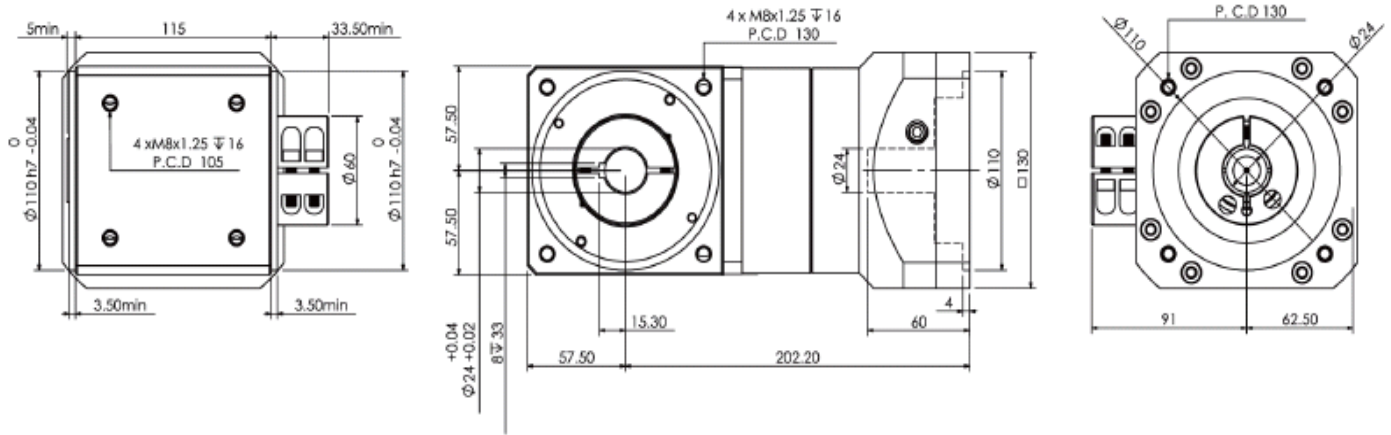
WS70F-GNP60



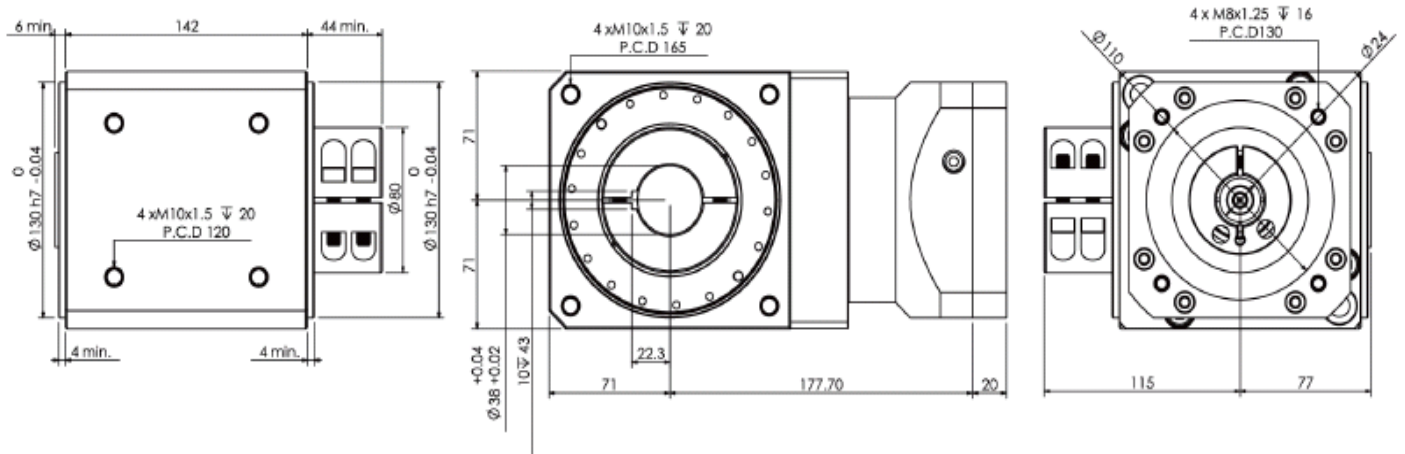
WS90F-GNP90



WS120F- GNP120



WS150F- GNP120



WS180F- GNP150

