

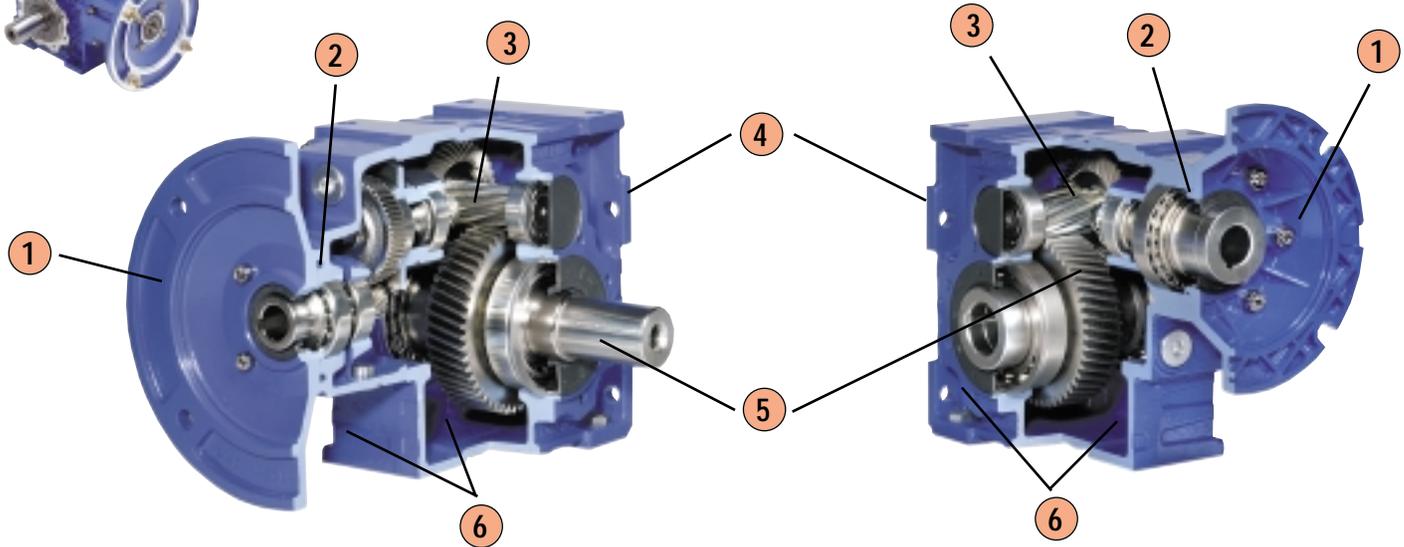
*R e c l a i m y o u r*  
**P O W E R**



**MOTOVARIO**  
THE INNOVATIVE TEAM IN POWER TRANSMISSION

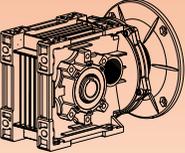
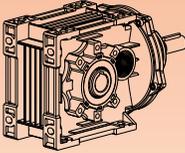
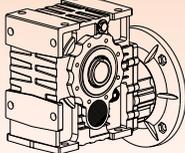
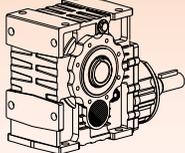


# Helical-Bevel Reducers



- ① NEMA and IEC motor inputs available for greater range of options.
- ② O-ring seals on the input flange prevent leaks more effectively than paper gaskets.
- ③ Double and Triple stage reduction available through Motovario's high precision computerized assembly process.
- ④ Squared, machined edges are perfect for vertical "J" mounting - difficult with rounded frames.
- ⑤ Shafts and gearing are heat treated in-house for a higher level of control over the finished product. This considerably reduces lead time and results in high quality gearing at competitive prices.
- ⑥ Polyester epoxy paint is applied on the inside and outside of the gearcase prior to machining. This baked-on paint provides a high level of protection against rust.
- ⑦ Models 040, 050 and 070 are provided with a hollow output bore as standard to help reduce inventory and add flexibility.
- ⑧ Smaller models have aluminum alloy housings, making them lighter, more heat-resistant and more easily mounted than traditional cast iron reducers.
- ⑨ Press-fit, keyless design on aluminum models allows higher torque, reduces backlash, prevents fretting corrosion and boosts shock load capacity.
- ⑩ Automated manufacturing process from an ISO 9001 certified company assures quality, reliable gearing.

## Nomenclature

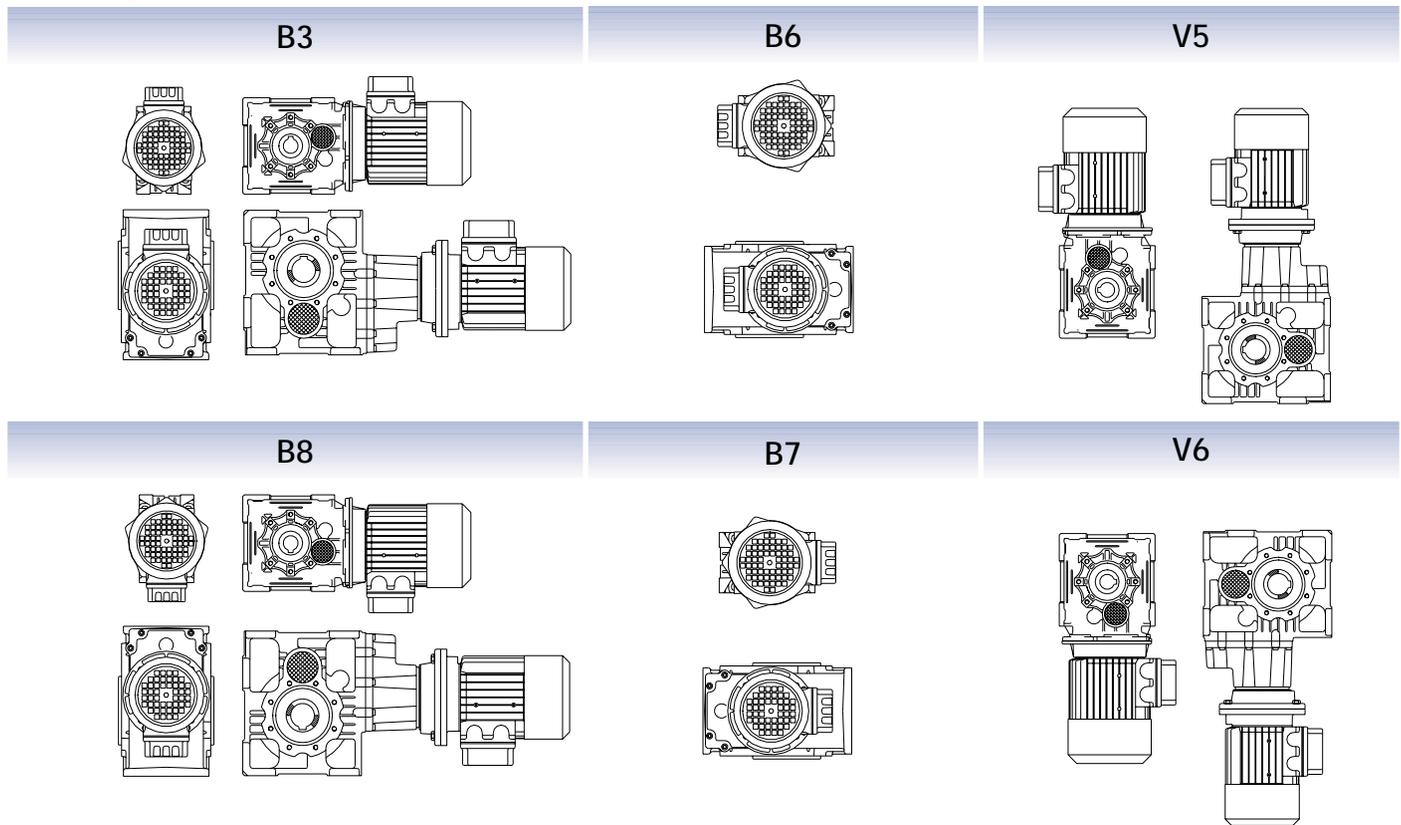
PRO		052	25.4	180TC	Foot Mount	B3		
<b>Model</b>		<b>Size and Stages</b>		<b>Ratio</b>	<b>Input Size</b>	<b>Output Design</b>	<b>Mounting Position</b>	
<b>PRO</b>	<b>RO</b>	Aluminum Housings	Cast Iron Housings	Ratios vary depending on the reducer and the number of reduction stages	56C	<b>Shaft Mounted</b>	B3	
		040	060		140TC	<b>Foot Mounted</b> standard hollow output bore on models 040, 050 and 070	B6	
Aluminum Housing Motor Input Flange	Aluminum Housing Input Shaft	050	080		180TC		single or double plug-in output shaft for models 040, 050 or 070	B7
		070	100		210TC		single or double integrated output shaft for models 060, 080, 100, 120 or 160	B8
			120		250TC		V5	
			160		280TC		V6	
		Double Reduction ...2				<b>Flange Mounted</b>		
		Triple Reduction ...3				optional F or FL mounting flange with hollow output bore		
								
Cast Iron Housing Motor Input Flange	Cast Iron Housing Input Shaft							

# Helical-Bevel Reducers

## Mounting Positions and Availability



### Mounting Positions



### NEMA Flange Availability

Model	Ratio	Available NEMA C Flanges					
		56C	140TC	180TC	210TC	250TC	280TC
PRO 042	7.6-64.1	●	●				
PRO 042	78.2	●					
PRO 052	7.9-64.9	●	●				
PRO 052	79.1	●					
PRO 053	-	●	●				
PRO 062	-	●	●	●			
PRO 063	-	●					
PRO 072	-	●	●				
PRO 073	-	●	●				
PRO 082	-			●	●		
PRO 083	-	●	●				
PRO 102	-			●	●		
PRO 103	-	●	●	●			
PRO 122	-				●	●	
PRO 123	-			●	●		
PRO 142	-					●	●
PRO 143	-			●	●	●	
PRO 162	-					●	●
PRO 163	-			●	●	●	

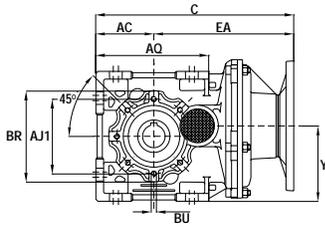


# Helical-Bevel Reducers

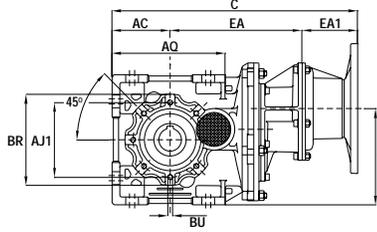
## PRO and RO

### PRO

Aluminum Housings

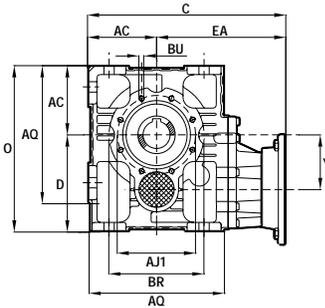


Double Stage

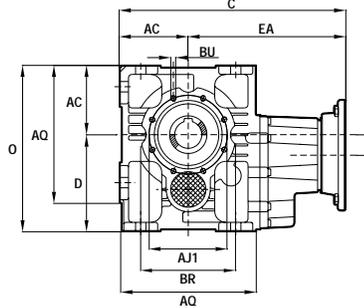


Triple Stage

Cast Iron Housings



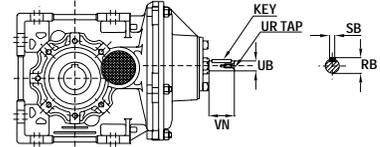
Double Stage



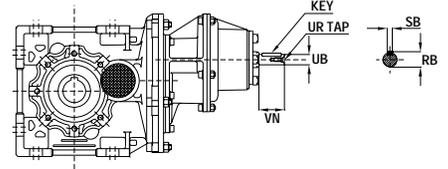
Triple Stage

### RO

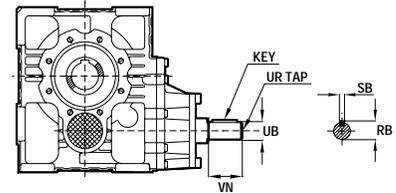
Double Stage



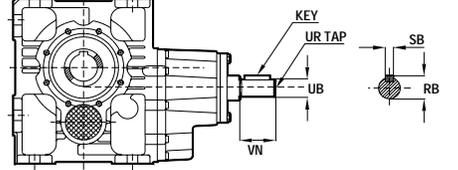
Triple Stage



Double Stage

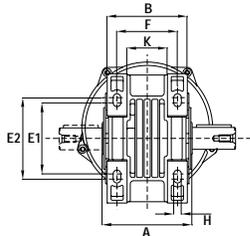


Triple Stage

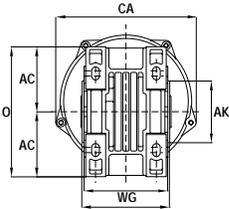


### Mounting Options

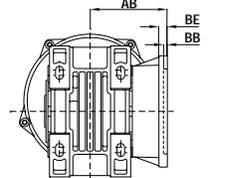
Foot Mounted



Shaft Mounted

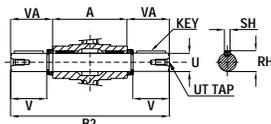
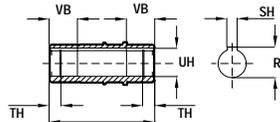
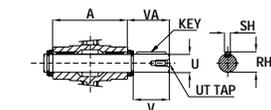
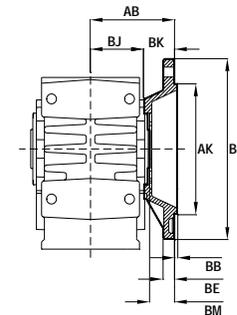
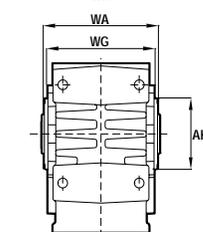
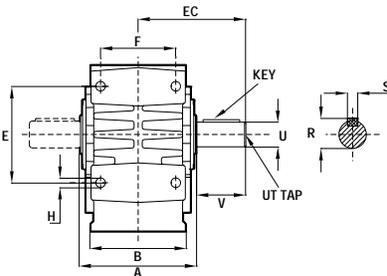


Flange Mounted



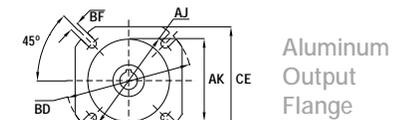
Aluminum Housings Rear View

Cast Iron Housings Rear View

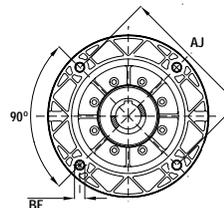


Hollow Output Bore

Single and Double Output Shafts



Aluminum Output Flange



Cast Iron Output Flange

# Helical-Bevel Reducers

## Dimensions



	042	052	053	062	063	072	073	082	083	102	103	122	123	142	143	162	163
<b>A</b>	3.94	4.41	4.41	5.51	5.51	5.51	5.51	6.30	6.30	7.87	7.87	10.24	10.24	10.63	10.63	11.42	11.42
<b>AB</b>	3.64 (4.82)	3.15 (4.33)	3.15 (4.33)	3.70	3.70	4.69	4.69	4.45	4.45	5.59	5.59	6.30	6.30	6.59	6.59	-	-
<b>AC</b>	2.56	3.15	3.15	3.15	3.15	3.54	3.54	3.94	3.94	4.92	4.92	6.10	6.10	6.50	6.50	7.09	7.09
<b>AJ</b>	3.54	5.91	5.91	6.50	6.50	6.50	6.50	8.46	8.46	10.43	10.43	11.81	11.81	11.81	11.81	-	-
<b>AJ1</b>	3.35	3.74	3.74	3.94	3.94	4.53	4.53	4.53	4.53	5.71	5.71	7.09	7.09	7.09	7.09	9.25	9.25
<b>AK</b>	2.76 <sup>+0.014</sup> <sub>0</sub>	4.53 <sup>+0.014</sup> <sub>0.036</sub>	4.53 <sup>+0.014</sup> <sub>0.036</sub>	5.12 <sup>+0.022</sup> <sub>0.052</sub>	5.12 <sup>+0.022</sup> <sub>0.052</sub>	5.12 <sup>+0.016</sup> <sub>0.041</sub>	5.12 <sup>+0.016</sup> <sub>0.041</sub>	7.09 <sup>+0.020</sup> <sub>0.048</sub>	7.09 <sup>+0.020</sup> <sub>0.048</sub>	9.06 <sup>+0.020</sup> <sub>0.048</sub>	9.06 <sup>+0.020</sup> <sub>0.048</sub>	9.84 <sup>+0.016</sup> <sub>0.041</sub>	9.84 <sup>+0.016</sup> <sub>0.041</sub>	9.84 <sup>+0.016</sup> <sub>0.041</sub>	9.84 <sup>+0.016</sup> <sub>0.041</sub>	-	-
<b>AK1</b>	2.76 <sup>+0</sup> <sub>0.018</sub>	3.15 <sup>+0</sup> <sub>0.021</sub>	3.15 <sup>+0</sup> <sub>0.021</sub>	3.35 <sup>+0</sup> <sub>0.021</sub>	3.35 <sup>+0</sup> <sub>0.021</sub>	3.74 <sup>+0</sup> <sub>0.021</sub>	3.74 <sup>+0</sup> <sub>0.021</sub>	3.94 <sup>+0</sup> <sub>0.021</sub>	3.94 <sup>+0</sup> <sub>0.021</sub>	4.72 <sup>+0</sup> <sub>0.021</sub>	4.72 <sup>+0</sup> <sub>0.021</sub>	5.91 <sup>+0</sup> <sub>0.025</sub>	5.91 <sup>+0</sup> <sub>0.025</sub>	5.91 <sup>+0</sup> <sub>0.025</sub>	5.91 <sup>+0</sup> <sub>0.025</sub>	7.87 <sup>+0</sup> <sub>0.025</sub>	7.87 <sup>+0</sup> <sub>0.025</sub>
<b>AQ</b>	5.02	6.02	6.02	5.94	5.94	6.89	6.89	7.68	7.68	9.65	9.65	12.01	12.01	12.99	12.99	14.17	14.17
<b>B</b>	3.54	3.94	3.94	4.41	4.41	4.92	4.92	5.43	5.43	6.77	6.77	8.46	8.46	9.45	9.45	10.16	10.16
<b>B2</b>	7.32	8.62	8.62	-	-	10.23	10.23	-	-	-	-	-	-	-	-	-	-
<b>BB</b>	0.20	0.24	0.24	0.14	0.14	0.24	0.24	0.16	0.16	0.16	0.16	0.20	0.20	0.20	0.20	-	-
<b>BD</b>	4.92	7.09	7.09	7.87	7.87	7.87	7.87	9.84	9.84	11.81	11.81	13.78	13.78	13.78	13.78	-	-
<b>BE</b>	0.35	0.39	0.39	0.47	0.47	0.51	0.51	0.55	0.55	0.55	0.55	0.59	0.59	0.59	0.59	-	-
<b>BF</b>	0.43	0.43	0.43	0.43	0.43	0.55	0.55	0.55	0.55	0.55	0.55	0.71	0.71	0.71	0.71	-	-
<b>BJ</b>	-	-	-	2.44	2.44	-	-	2.83	2.83	3.54	3.54	4.59	4.59	4.88	4.88	-	-
<b>BK</b>	-	-	-	1.26	1.26	-	-	1.61	1.61	2.05	2.05	1.71	1.71	1.71	1.71	-	-
<b>BM</b>	-	-	-	0.94	0.94	-	-	1.30	1.30	1.65	1.65	1.18	1.18	1.28	1.28	-	-
<b>BR</b>	3.94	4.33	4.33	4.72	4.72	5.51	5.51	5.51	5.51	6.89	6.89	8.66	8.66	8.66	8.66	10.63	10.63
<b>BU</b>	M8 n4	M8 n6	M8 n6	M6 n8	M6 n8	M8 n6	M8 n6	M8 n8	M8 n8	M10 n8	M10 n8	M12 n8	M12 n8	M12 n8	M12 n8	M16 n8	M16 n8
<b>C</b>	10.08	10.87	12.92	9.76	10.73	12.08	14.98	11.89	12.98	14.57	16.49	16.81	20.86	19.26	23.39	19.85	23.98
<b>CA</b>	5.98	5.98	5.98	-	-	8.58	8.58	-	-	-	-	-	-	-	-	-	-
<b>CE</b>	4.33	5.59	5.59	-	-	6.69	6.69	-	-	-	-	-	-	-	-	-	-
<b>D</b>	-	-	-	4.49	4.49	-	-	5.51	5.51	6.89	6.89	8.66	8.66	10.43	10.43	11.02	11.02
<b>E</b>	3.54	4.33	4.33	4.33	4.33	-	-	5.51	5.51	6.89	6.89	8.66	8.66	9.25	9.25	9.84	9.84
<b>E1</b>	-	-	-	-	-	4.33	4.33	-	-	-	-	-	-	-	-	-	-
<b>E2</b>	-	-	-	-	-	4.96	4.96	-	-	-	-	-	-	-	-	-	-
<b>EA</b>	7.52	7.72	6.38	6.61	7.58	8.54	8.05	7.95	9.04	9.65	11.57	10.71	14.76	12.76	16.89	12.76	16.89
<b>EA1</b>	-	-	3.39	-	-	-	3.39	-	-	-	-	-	-	-	-	-	-
<b>EC</b>	-	-	-	5.12	5.12	-	-	6.30	6.30	7.87	7.87	9.84	9.84	10.83	10.83	12.40	12.40
<b>F</b>	2.89	3.15	3.15	3.70	3.70	3.74	3.74	4.33	4.33	5.51	5.51	6.89	6.89	7.87	7.87	8.46	8.46
<b>G</b>	0.31	0.39	0.39	0.39	0.39	0.47	0.47	0.47	0.47	0.59	0.59	0.71	0.71	0.79	0.79	0.87	0.87
<b>H</b>	0.35	0.35	0.35	0.43	0.43	0.47	0.47	0.55	0.55	0.71	0.71	0.87	0.87	0.87	0.87	0.87	0.87
<b>K</b>	1.77	2.01	2.01	-	-	2.48	2.48	-	-	-	-	-	-	-	-	-	-
<b>O</b>	5.12	6.30	6.30	7.64	7.64	7.87	7.87	9.45	9.45	11.81	11.81	14.76	14.76	16.93	16.93	18.11	18.11
<b>R</b>	0.64	0.86	0.86	1.11	1.11	1.11	1.11	1.20	1.20	1.72	1.72	2.02	2.02	2.45	2.45	3.13	3.13
<b>RB</b>	0.84	0.84	0.84	0.84	0.72	0.72	0.72	0.97	0.84	1.22	0.97	1.75	1.50	1.91	1.78	1.94	1.81
<b>RH</b>	0.84	1.12	1.12	1.52	1.52	1.52	1.52	1.67	1.67	2.23	2.23	2.65	2.65	3.03	3.03	3.59	3.59
<b>S</b>	0.188	0.250	0.250	0.250	0.250	0.250	0.250	0.375	0.375	0.500	0.500	0.625	0.625	0.750	0.750	0.875	0.875
<b>SB</b>	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.250	0.250	0.313	0.313	0.375	0.375
<b>SH</b>	0.188	0.250	0.250	0.313	0.313	0.313	0.313	0.375	0.375	0.500	0.500	0.625	0.625	0.625	0.625	0.750	0.750
<b>TH</b>	-	-	-	0.47	0.47	-	-	0.59	0.59	0.71	0.71	0.87	0.87	0.87	0.87	0.98	0.98
<b>U</b>	0.750 <sup>+0</sup> <sub>0.005</sub>	1.000 <sup>+0</sup> <sub>0.005</sub>	1.000 <sup>+0</sup> <sub>0.005</sub>	1.250 <sup>+0</sup> <sub>0.005</sub>	1.250 <sup>+0</sup> <sub>0.005</sub>	1.250 <sup>+0</sup> <sub>0.005</sub>	1.250 <sup>+0</sup> <sub>0.005</sub>	1.625 <sup>+0</sup> <sub>0.005</sub>	1.625 <sup>+0</sup> <sub>0.005</sub>	2.000 <sup>+0</sup> <sub>0.005</sub>	2.000 <sup>+0</sup> <sub>0.005</sub>	2.375 <sup>+0</sup> <sub>0.005</sub>	2.375 <sup>+0</sup> <sub>0.005</sub>	2.875 <sup>+0</sup> <sub>0.005</sub>	2.875 <sup>+0</sup> <sub>0.005</sub>	3.625 <sup>+0</sup> <sub>0.005</sub>	3.625 <sup>+0</sup> <sub>0.005</sub>
<b>UB</b>	0.750 <sup>+0</sup> <sub>0.005</sub>	0.750 <sup>+0</sup> <sub>0.005</sub>	0.750 <sup>+0</sup> <sub>0.005</sub>	0.750 <sup>+0</sup> <sub>0.005</sub>	0.625 <sup>+0</sup> <sub>0.005</sub>	0.625 <sup>+0</sup> <sub>0.005</sub>	0.625 <sup>+0</sup> <sub>0.005</sub>	0.875 <sup>+0</sup> <sub>0.005</sub>	0.750 <sup>+0</sup> <sub>0.005</sub>	1.125 <sup>+0</sup> <sub>0.005</sub>	0.875 <sup>+0</sup> <sub>0.005</sub>	1.625 <sup>+0</sup> <sub>0.005</sub>	1.375 <sup>+0</sup> <sub>0.005</sub>	1.750 <sup>+0</sup> <sub>0.005</sub>	1.625 <sup>+0</sup> <sub>0.005</sub>	1.750 <sup>+0</sup> <sub>0.005</sub>	1.625 <sup>+0</sup> <sub>0.005</sub>
<b>UH</b>	0.750 <sup>+0.001</sup> <sub>0</sub>	1.000 <sup>+0.001</sup> <sub>0</sub>	1.000 <sup>+0.001</sup> <sub>0</sub>	1.375 <sup>+0.001</sup> <sub>0</sub>	1.375 <sup>+0.001</sup> <sub>0</sub>	1.375 <sup>+0.001</sup> <sub>0</sub>	1.375 <sup>+0.001</sup> <sub>0</sub>	1.500 <sup>+0.001</sup> <sub>0</sub>	1.500 <sup>+0.001</sup> <sub>0</sub>	2.000 <sup>+0.001</sup> <sub>0</sub>	2.000 <sup>+0.001</sup> <sub>0</sub>	2.375 <sup>+0.0015</sup> <sub>0</sub>	2.375 <sup>+0.0015</sup> <sub>0</sub>	2.750 <sup>+0.0015</sup> <sub>0</sub>	2.750 <sup>+0.0015</sup> <sub>0</sub>	3.250 <sup>+0.0015</sup> <sub>0</sub>	3.250 <sup>+0.0015</sup> <sub>0</sub>
<b>UR</b>	1/4-20	1/4-20	1/4-20	1/4-20	1/4-20	1/4-20	1/4-20	1/4-20	1/4-20	3/8-16	1/4-21	5/8-11	1/2-13	3/4-10	5/8-11	5/8-11	5/8-11
<b>UT</b>	1/4-20	3/8-16	3/8-16	1/2-13	1/2-13	1/2-13	1/2-13	5/8-11	5/8-11	3/4-10	3/4-10	3/4-10	3/4-10	3/4-10	3/4-10	1-8	1-8
<b>V</b>	1.58	1.97	1.97	2.36	2.36	2.36	2.36	3.15	3.15	3.94	3.94	4.72	4.72	5.51	5.51	6.69	6.69
<b>VA</b>	1.71	2.10	2.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>VB</b>	1.18	1.18	1.18	1.38	1.38	1.38	1.38	1.65	1.65	1.97	1.97	2.76	2.76	2.95	2.95	3.54	3.54
<b>VN</b>	0.87	0.87	0.87	1.58	1.58	1.58	1.58	1.97	1.58	2.36	1.97	4.33	2.36	4.33	3.15	4.33	4.33
<b>WA</b>	3.82	4.25	4.25	5.24	5.24	5.35	5.35	6.06	6.06	7.48	7.48	9.65	9.65	10.24	10.24	11.02	11.02
<b>WG</b>	3.62	4.02	4.02	4.88	4.88	5.12	5.12	5.66	5.66	7.09	7.09	9.17	9.17	9.76	9.76	10.55	10.55
<b>Y</b>	2.24	3.31	3.31	2.52	0.94	4.57	4.57	3.15	1.18	3.94	1.46	4.92	1.77	5.71	1.77	6.30	2.36
<b>Input Key</b>																	
<b>Length</b>	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.500	1.500	1.875	1.875	2.500	2.500	3.375	3.375
<b>Square</b>	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.250	0.250	0.313	0.313	0.375	0.375
<b>Output Key</b>																	
<b>Length</b>	1.125	1.500	1.500	1.875	1.875	1.875	1.875	2.388	2.388	3.133	3.133	3.750	3.750	4.000	4.000	5.000	5.000
<b>Square</b>	0.188	0.250	0.250	0.250	0.250	0.250	0.250	0.388	0.388	0.500	0.500	0.633	0.633	0.750	0.750	0.875	0.875
<b>Weight (lbs)</b>	12	13	16	35	42	16	20	57	75	135	146	243	265	335	359	379	404



# Helical-Bevel Gear Reducer Ratings

## 1750 RPM

Model	Ratio	RPM	Torque (in-lbs)	Max. HP	Output OHL
PRO 042 RO 042	7.6	230	885	3.4	285
	10.6	165	885	2.4	311
	12.9	136	885	2.0	335
	14.5	121	885	1.8	351
	16.5	106	1062	1.9	368
	23.0	76	1062	1.4	409
	28.0	63	1062	1.1	428
	31.3	56	1062	1.0	446
	33.8	52	1062	0.9	462
	47.1	37	1062	0.7	520
	57.4	30	1062	0.5	555
	64.1	27	973	0.4	573
	78.2	22	973	0.4	585
PRO 052 RO 052	7.9	222	1593	5.9	322
	9.5	184	1593	4.9	350
	11.6	151	1593	4.0	366
	14.6	120	1593	3.2	406
	17.1	102	1858	3.2	429
	20.5	85	1858	2.7	456
	25.0	70	1858	2.2	481
	31.6	55	1770	1.6	518
	35.1	50	1681	1.4	539
	42.0	42	1770	1.2	572
	51.3	34	1947	1.1	618
	64.9	27	1770	0.8	661
	79.1	22	1770	0.7	674
PRO 053 RO 053	73.7	24	1947	0.8	674
	93.3	19	1947	0.6	674
	111.6	16	1947	0.5	674
	136.5	13	1947	0.4	674
	172.5	10	1947	0.3	674
	197.1	8.9	1947	0.3	674
	249.1	7.0	1947	0.2	674
	271.2	6.5	1947	0.2	674
	342.7	5.1	1947	0.2	674
	PRO 062 RO 062	8.2	213	2212	7.9
10.2		172	2212	6.3	978
12.9		136	2831	6.4	1053
16.1		109	2831	5.1	1134
20.4		86	2654	3.8	1236
25.5		69	2831	3.2	1325
31.9		55	2212	2.0	1423
36.1		48	2477	2.0	1488

Model	Ratio	RPM	Torque (in-lbs)	Max. HP	Output OHL	
PRO 063 RO 063	38.6	45	3008	2.4	1530	
	48.3	36	3008	1.9	1640	
	62.4	28	3008	1.5	1789	
	77.9	22	3008	1.2	1843	
	106.2	16	3008	0.9	1843	
	123.6	14	3008	0.8	1843	
	150.7	12	3008	0.6	1843	
	189.8	9.2	3008	0.5	1843	
	237.3	7.4	2212	0.3	1843	
	268.8	6.5	2477	0.3	1843	
	PRO 072 RO 072	8.4	208	3098	10.4	1041
		10.0	175	3098	8.6	1129
		12.4	141	3098	7.0	1210
14.9		117	3717	7.0	1290	
17.9		98	3717	5.8	1368	
22.2		79	3717	4.7	1468	
27.5		64	3717	3.8	1581	
33.0		53	3717	3.2	1678	
40.9		43	3540	2.4	1829	
45.6		38	3098	1.9	1911	
PRO 073 RO 073	54.9	32	3098	1.6	2010	
	68.0	26	3098	1.3	2139	
	43.9	40	3983	2.7	1837	
	52.8	33	3983	2.2	2008	
	65.3	27	3983	1.1	2197	
	80.8	22	3983	1.5	2248	
	97.3	18	3983	1.2	2248	
	120.3	15	3983	1.0	2248	
	149.7	12	3983	0.8	2248	
	180.2	10	3983	0.7	2248	
PRO 082 RO 082	222.9	7.9	3983	0.5	2248	
	260.2	6.7	3983	0.5	2248	
	321.9	5.4	3983	0.4	2248	
	358.0	4.9	3983	0.3	2248	
	442.8	4.0	3983	0.3	2248	
	8.2	213	4424	15.8	1302	
	10.2	172	4424	12.7	1399	
	12.9	136	5663	12.9	1507	
	16.1	109	4663	10.3	1620	
20.4	86	5309	7.6	1767		
25.5	69	5663	6.5	1899		
31.9	55	4424	4.1	2037		

# Helical-Bevel Gear Reducer Ratings

1750 RPM



Model	Ratio	RPM	Torque (in-lbs)	Max. HP	Output OHL
PRO 083 RO 083	40.9	43	6017	4.5	2208
	51.1	34	6017	3.6	2393
	64.4	27	6017	2.9	2574
	80.4	22	6017	2.3	2630
	99.6	18	6017	1.9	2630
	124.3	14	6017	1.5	2630
	162.8	11	6017	1.1	2630
	197.0	8.9	6017	0.9	2630
	246.3	7.1	4424	0.6	2630
	279.0	6.3	4955	0.5	2630
PRO 102 RO 102	7.8	224	8848	33.0	1922
	9.6	182	8848	26.8	2062
	12.4	141	11502	27.2	2222
	15.2	115	11502	22.1	2381
	19.6	89	10618	15.8	2538
	24.1	73	11502	14.0	2639
	30.1	58	8848	8.6	2985
	38.2	46	10618	8.1	3248
	PRO 103 RO 103	37.1	47	12387	10.3
45.6		38	12387	8.4	3432
61.9		28	12387	6.2	3810
76.0		23	12387	5.0	3934
106.4		16	12387	3.6	3934
120.5		15	12387	3.2	3934
153.8		11	12387	2.5	3934
186.2		9.4	12387	2.1	3934
232.7		7.5	8848	1.2	3934
295.1		5.9	10618	1.1	3934
PRO 122 RO 122	7.8	224	17696	65.9	2816
	12.4	141	23005	54.3	3262
	15.2	115	23005	44.2	3502
	19.6	89	22120	33.0	3824
	24.1	73	23005	27.9	4104
	30.1	58	17696	17.2	4376
	38.2	46	18581	14.2	4763
	PRO 123 RO 123	38.1	46	24775	20.1
46.8		37	24775	16.3	5101
61.9		28	24775	12.4	5647
76.0		23	24775	10.1	5845
104.0		17	24775	7.3	5845
120.5		15	24775	6.3	5845
151.4		12	24775	5.0	5845
180.7		10	24775	4.2	5845
225.9		7.7	17696	2.4	5845
286.5		6.1	18581	2.0	5845

Model	Ratio	RPM	Torque (in-lbs)	Max. HP	Output OHL	
PRO 142 RO 142	7.4	236	24775	98.2	3314	
	9.5	184	24775	75.9	3641	
	11.6	151	30968	77.8	3841	
	15.0	117	30968	60.2	4223	
	18.3	96	32738	52.1	4499	
	23.8	74	32738	40.1	4944	
	29.1	60	32738	32.9	5211	
	36.4	48	32738	26.3	5670	
	PRO 143 RO 143	36.9	47	35392	29.6	5697
		47.1	37	35392	23.2	6171
58.1		30	37162	19.7	6632	
74.3		24	37162	15.4	6969	
96.0		18	37162	11.9	6969	
119.2		15	37162	9.6	6969	
152.2		11	37162	7.5	6969	
185.7		9.4	37162	6.2	6969	
203.6		8.6	37162	5.6	6969	
232.2		7.5	37162	4.9	6969	
PRO 162 RO 162	254.5	6.9	37162	4.5	6969	
	7.6	230	33623	128.9	3802	
	10.8	162	33623	90.7	4261	
	12.0	146	40701	98.9	4395	
	17.1	102	40701	69.6	4938	
	19.1	92	40701	62.4	5157	
	23.8	74	40701	49.9	5581	
	27.1	65	44240	47.7	5784	
	30.0	58	44240	43.1	5962	
	33.9	52	46010	39.7	6244	
PRO 163 RO 163	37.5	47	46010	35.9	6458	
	48.7	36	51319	32.5	7051	
	60.1	29	51319	26.3	7561	
	69.2	25	51319	22.9	7846	
	84.2	21	51319	18.8	7868	
	94.5	19	51319	16.7	7868	
	120.8	14	51319	13.1	7868	
	135.4	13	51319	11.7	7868	
	150.0	12	51319	11.7	7868	
	172.9	10	51319	9.2	7868	
210.0	8.3	51319	7.5	7868		

# Calculate your savings using a Motovario Helical-Bevel Reducer

Consider the following example:

Traditional Worm Reducer	Motovario Helical-Bevel Reducer
Efficiency - 75%	Efficiency - 95%
Ratio: 20:1	Ratio: 20:1
Motor input: 1.0 HP, 1750 RPM, at 90% efficiency; cost of electricity is assumed to be \$4.32 per kilowatt hour*	
<b>Goal: Achieve 300 inch-pounds of output torque</b>	

**Step 1** Convert torque to foot lbs  $300 \text{ inch-lbs} / 12 = 25 \text{ foot lbs}$

**Step 2** Determine horsepower output required to produce desired torque  $\frac{\text{Torque} \times \text{motor input speed}}{5250 \times \text{reduction ratio} \times \text{reducer efficiency}}$

*Worm Reducer: 0.56 HP required*     *Helical-Bevel Reducer: 0.44 HP required*  
*(25 x 1750 / 5250 x 20 x 75)*     *(25 x 1750 / 5250 x 20 x 95)*

**Step 3** Calculate input horsepower to the reducer to generate the required output  $\frac{\text{required output horsepower}}{\text{motor efficiency}}$

*Worm Reducer: 0.62 HP required*     *Helical-Bevel Reducer: 0.49 HP*  
*(0.56 / 0.90)*     *(0.44 / 0.90)*

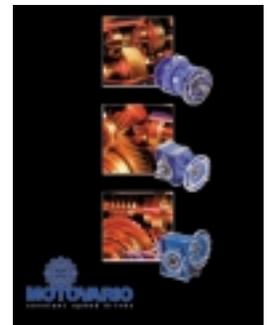
**Step 4** Calculate the savings  $\text{Cost} = (\text{Input HP required (from step \# 3 above)}) \times (\text{running time of the system}) \times (\text{input power in kilowatts}) \times (\text{cost per kilowatt hour of electricity used})$

**Worm Reducer Cost - Helical Bevel Reducer Cost = Savings**

Cost Per 8 Hour Day  
*Worm Reducer:*  $0.62 \times 8 \times 0.75 \times 4.32 = \$16.07$      *Helical-Bevel Reducer:*  $0.49 \times 8 \times 0.75 \times 4.32 = \$12.70$

**SAVINGS**  $\$16.07 - \$12.70 = \$3.37 \text{ per 8 hour day}$   
 $\$3.37 \times 5 = \$16.85 \text{ per 40 hour week}$   
 $\$16.85 \times 52 = \mathbf{\$876.20 \text{ per year}}$

\* Source: Energy Information Association 1998 census on industrial electricity - US Average.



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