

Also Available from Motovario™

SMARTBOX™

Motovario™ SmartBox™ was designed to be the most competitive high-efficiency gear reducer series in today's market. SmartBox™ reducers are built with standardized parts to simplify the production process and improve delivery.

All SmartBox™ have the Power Case™ that features one-piece housings for more torque transmission, wider bearing seats for better overhung load, and a large inspection cover for faster, easier assembly.

The SmartBox™ B series features a bevel pinion supported between two bearings for more precise gear mesh and the elimination of gear deflection. The double-bearing design improves torque output and reducer shock-load capacity by removing the weakest link.

Contact Motovario™ for more information or design specification on the SmartBox™ H Series In-Line, B Series Helical Bevel or S Series Parallel Shaft Mount line of reducers.



H Series In-Line Helical



B Series Helical Bevel



S Series Parallel Shaft Mount



MOTOVARIO™

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NMRV®



NRV™

Decline of the
IRON AGE

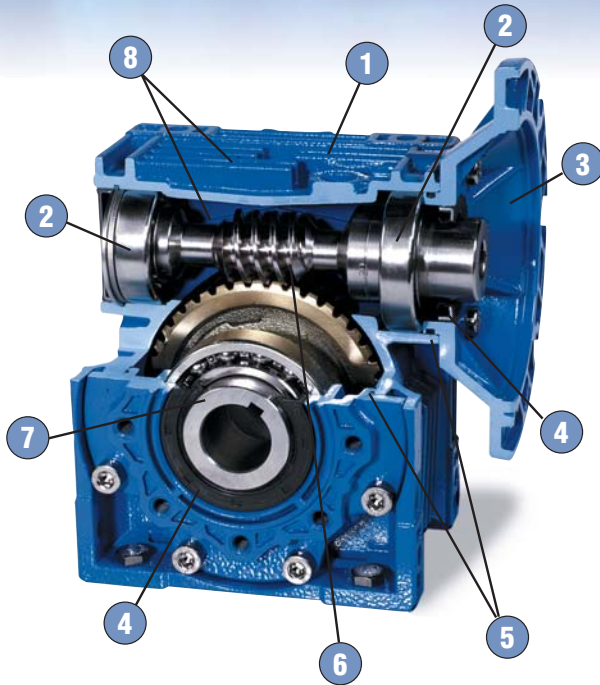


MOTOVARIO™

THE INNOVATIVE TEAM IN POWER TRANSMISSION

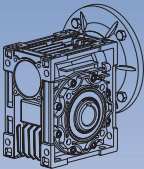
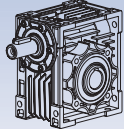


Worm Gear Reducers



- 1 Aluminum alloy housing with patented heat sink design provides greater surface area and higher thermal capacity than traditional cast-iron housings.
- 2 Two bearings along the input shaft prevent leaks and contribute to flexibility in mounting. High quality SKF bearings increase reducer life versus worm reducers with a bushing on the input.
- 3 NEMA and IEC motor inputs available for greater customer flexibility.
- 4 Double-lip oil seals aid the reducer's thermal capacity and extended the reducer's oil life.
- 5 Use of O-rings on the input flange and output cover prevents leaks more effectively than a paper gasket.
- 6 Hardened worm shaft gives increased durability versus forged worm shafts.
- 7 Standard hollow output bore and optional plug-in shafts provide greater flexibility in ordering and reduced inventory.
- 8 Polyester epoxy paint applied on the inside and outside of the gearcase protects against rust.
- 9 No vent plug or breather is required. NMRV® and NRV™ are universal mounting, sealed for life, maintenance-free reducers, with little risk of oil oxidation or contamination.
- 10 No compression chamber ("bladder") required, preventing leaks and the risk of oil oxidation and contamination, and contributing to mounting flexibility.
- 11 Automated manufacturing process from an ISO 9001 certified company assures quality, reliable gearing.
- 12 Aluminum units are prefilled with synthetic oil; cast iron units are prefilled with mineral oil.

Nomenclature

NMRV®	110	40	180TC	Foot Mount	B3	Torque Arm	
Model	Size	Ratio	Input Size	Output Design	Mounting	Accessories	
 <p>NMRV® Motor Input Flange</p>	Aluminum Housing	5	48C	Shaft Mounted standard hollow output bore	B3	Torque Arm	
	030	7.5	56C		B6	Baseplate	
	040	10	140TC		B7	Double Extension Worm Shaft	
	050	15	180TC		B8		
	063	20	210TC		V5		
	075	25	250TC	V6	Protective Cover		
	 <p>NRV™ Input Shaft</p>	105	30		Flange Mounted optional FA, FB, FC, FD or FE mounting flange (depending on model) and hollow output bore		
		Cast Iron Housing	40				
		110	50				
		130	60				
150		80					
		100					

Worm Gear Reducer Ratings

1750 RPM



	Exact Ratio i	Output Speed RPM	Max Torque in-lbs	Max Input HP	OHL
030	5	350	159	1.02	113
	7.5	233	159	0.69	129
	10	175	159	0.54	142
	15	117	159	0.38	163
	20	88	159	0.30	179
	25	70	186	0.30	193
	30	58	177	0.25	205
	40	44	159	0.19	225
	50	35	150	0.15	243
	60	29	142	0.13	259
80	22	115	0.09	284	

040	5	350	301	1.88	221
	7.5	233	354	1.51	253
	10	175	354	1.16	279
	15	117	354	0.80	319
	20	88	345	0.61	350
	25	70	336	0.50	378
	30	58	398	0.53	403
	40	44	363	0.39	441
	50	35	345	0.31	476
	60	29	319	0.25	507
80	22	292	0.19	556	
100	18	257	0.15	595	

050	5	350	549	3.43	322
	7.5	233	628	2.64	369
	10	175	637	2.06	406
	15	117	655	1.48	464
	20	88	646	1.14	510
	25	70	619	0.90	551
	30	58	743	0.96	586
	40	44	672	0.70	643
	50	35	646	0.57	694
	60	29	602	0.47	739
80	22	575	0.38	810	
100	18	487	0.28	866	

063	7.5	233	1133	4.77	463
	10	175	1150	3.67	510
	15	117	1239	2.76	583
	20	88	1194	2.05	641
	25	70	1150	1.64	692
	30	58	1416	1.77	736
	40	44	1283	1.27	807
	50	35	1194	1.01	871
	60	29	1150	0.86	928
	80	22	1079	0.66	1017
100	18	1044	0.57	1088	

075	7.5	233	1637	6.81	549
	10	175	1725	5.45	604
	15	117	1770	3.86	691
	20	88	1858	3.15	759
	25	70	1770	2.46	820
	30	58	2035	2.48	873
	40	44	1947	1.88	957
	50	35	1858	1.50	1033
	60	29	1770	1.26	1099
	80	22	1681	0.97	1205
100	18	1593	0.80	1289	

	Exact Ratio i	Output Speed RPM	Max Torque in-lbs	Max Input HP	OHL
090	7.5	233	2566	10.56	631
	10	175	2743	8.56	694
	15	117	3185	6.86	794
	20	88	3141	5.19	873
	25	70	3008	4.08	942
	30	58	3628	4.31	1003
	40	44	3185	2.95	1100
	50	35	3008	2.32	1187
	60	29	2831	1.90	1264
	80	22	2522	1.39	1386
100	18	2389	1.12	1482	

105 110	7.5	233	4247	17.48	776
	10	175	4601	14.36	853
	15	117	5043	10.86	976
	20	88	4955	8.10	1073
	25	70	5220	6.90	1158
	30	58	5574	6.53	1233
	40	44	5397	4.81	1352
	50	35	5309	3.93	1459
	60	29	4955	3.19	1553
	80	22	4336	2.25	1703
100	18	4070	1.79	1821	

130	7.5	233	6636	27.01	1017
	10	175	7255	22.64	1119
	15	117	8140	17.33	1279
	20	88	8052	13.00	1407
	25	70	8229	10.88	1518
	30	58	9202	10.65	1616
	40	44	9290	8.27	1772
	50	35	8671	6.42	1913
	60	29	7963	5.12	2036
	80	22	7432	3.79	2233
100	18	6548	2.84	2387	

150	7.5	233	10618	43.22	1425
	10	175.0	10972	33.86	1568
	15	117	11060	23.27	1793
	20	88	11502	18.58	1971
	25	70	10618	14.04	2127
	30	58	10618	11.85	2265
	40	44	13715	12.21	2484
	50	35	12387	9.05	2680
	60	29	11149	7.07	2854
	80	22	10175	5.20	3129
100	18	8848	3.84	3346	

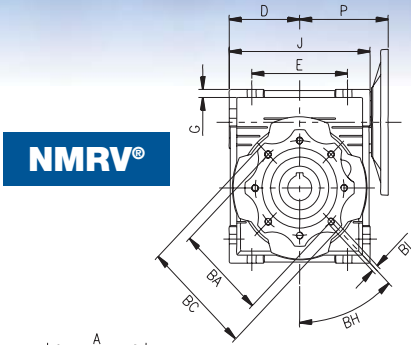


Worm Gear Reducers

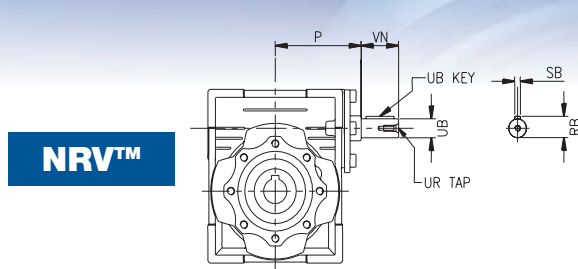
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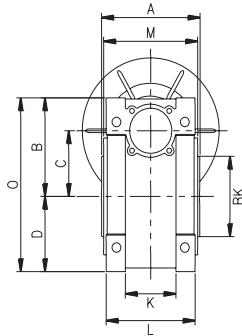
MOTOWA



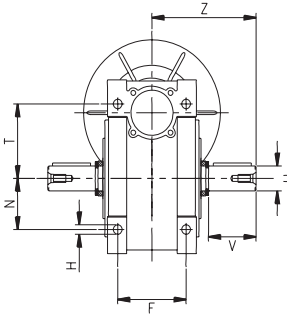
NMRV®



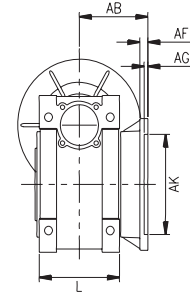
NRV™



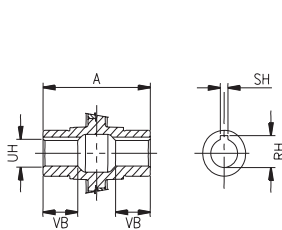
Shaft Mount



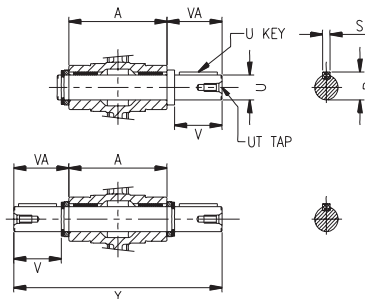
Foot Mount



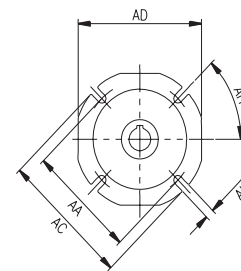
Flange Mount



Hollow Output Bore



Output Shaft



Output Flange

Hollow Output Bore

	030	040	050	063	075	090	105	110	130	150
RH	0.71	0.84	1.12	1.24	1.37	1.52	1.80	1.80	1.93	2.22
SH	0.1875	0.1875	0.250	0.250	0.250	0.313	0.375	0.375	0.375	0.500
UH	$0.625^{+0.001}_0$	$0.750^{+0.001}_0$	$1.000^{+0.001}_0$	$1.125^{+0.001}_0$	$1.250^{+0.001}_0$	$1.375^{+0.001}_0$	$1.625^{+0.001}_0$	$1.625^{+0.001}_0$	$1.750^{+0.001}_0$	$2.000^{+0.001}_0$
VB	0.83	1.14	1.28	1.42	1.56	1.77	1.97	1.97	2.24	2.85

Output Shaft

	030	040	050	063	075	090	105	110	130	150
R	0.70	0.83	1.11	1.23	1.36	1.51	1.79	1.79	1.92	2.22
S	0.1875	0.1875	0.250	0.250	0.250	0.3125	0.375	0.375	0.375	0.500
U	$0.625^{+0.0005}_0$	$0.750^{+0.0005}_0$	$1.000^{+0.0005}_0$	$1.125^{+0.0005}_0$	$1.250^{+0.0005}_0$	$1.375^{+0.0005}_0$	$1.625^{+0.0005}_0$	$1.625^{+0.0005}_0$	$1.750^{+0.0005}_0$	$2.000^{+0.0005}_0$
U KEY	0.1875 x 1.125	0.1875 x 1.500	0.250 x 1.500	0.250 x 1.875	0.250 x 2.250	0.3125 x 2.50	0.375 x 2.750	0.375 x 2.750	0.375 x 2.750	0.500 x 3.500
UT	1/4 - 20	1/4 - 20	3/8 - 16	3/8 - 16	1/2 - 13	1/2 - 13	5/8 - 11	5/8 - 11	5/8 - 11	3/4 - 10
V	1.57	1.97	1.97	2.36	2.76	3.15	3.54	3.54	3.54	3.94
VA	1.67	2.09	2.11	2.50	2.89	3.33	3.72	3.72	3.74	4.13
Y	5.82	7.25	7.84	9.41	10.50	12.17	13.54	13.54	14.17	16.13



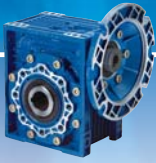
	030	040	050	063	075	090	105	110	130	150
A	2.48	3.07	3.62	4.41	4.72	5.51	6.10	6.10	6.69	7.87
B	2.24	2.81	3.31	4.02	4.69	5.31	6.59	6.59	7.38	9.06
BA	2.56	2.95	3.35	3.74	4.53	5.12	6.50	6.50	8.46	8.46
BC	2.95	3.43	3.94	4.33	5.51	6.30	7.87	7.87	9.84	9.84
BH	90°□	45°□	45°□	45°□	45°□	45°□	45°□	45°□	45°□	45°□
BK	2.165 ⁺⁰ _{-0.0018}	2.362 ⁺⁰ _{-0.0018}	2.756 ⁺⁰ _{-0.0018}	3.150 ⁺⁰ _{-0.0021}	3.740 ⁺⁰ _{-0.0021}	4.331 ⁺⁰ _{-0.0021}	5.118 ⁺⁰ _{-0.0025}	5.118 ⁺⁰ _{-0.0025}	7.087 ⁺⁰ _{-0.0025}	7.087 ⁺⁰ _{-0.0025}
BL	M6x11	M6x10	M8x10	M8x14	M8x14	M10x18	M10x18	M10x18	M12x21	M12x21
C	1.18	1.57	1.97	2.48	2.95	3.54	4.33	4.33	5.12	5.91
D	1.57	1.97	2.36	2.83	3.39	4.06	5.02	5.02	5.81	6.69
E	2.13	2.76	3.15	3.94	4.72	5.51	6.69	6.69	7.87	9.45
F	1.73	2.36	2.76	3.35	3.54	3.94	4.53	4.53	4.72	5.71
G	0.22	0.26	0.28	0.31	0.39	0.43	0.63	0.57	0.61	0.71
H	0.26	0.26	0.33	0.33	0.45	0.51	0.55	0.55	0.63	0.71
J	3.15	3.98	4.76	5.75	6.85	8.19	9.94	9.94	11.52	13.39
K	1.26	1.69	1.93	2.64	2.83	2.91	-	-	-	-
L	2.20	2.80	3.35	4.06	4.41	5.12	5.67	5.67	6.10	7.28
M	2.28	2.87	3.43	4.17	4.49	5.28	5.83	5.83	6.38	7.56
N	1.06	1.38	1.57	1.97	2.36	2.76	3.35	3.35	3.94	4.72
O	3.82	4.78	5.67	6.85	8.07	9.37	11.61	11.61	13.19	15.75
P	2.64	3.15	3.54	4.13	4.96	5.63	6.81	6.81	7.60	8.46
Q	0.83	2.36	2.91	3.54	4.13	4.92	5.59	5.59	6.38	7.68
T	1.73	2.17	2.52	3.15	3.66	4.02	4.92	4.92	5.51	7.09
Z	2.91	3.63	3.92	4.71	5.25	6.09	6.77	6.77	7.09	8.07

Output Flange

		AA	AB	AC	AD	AF	AG	AH	AK	AL
030	FA	2.68	2.15	3.15	2.76	0.24	0.16	45°□	1.969 ^{+0.0015} ₀	0.26
	FB	2.95	2.64	4.33	3.74	0.28	0.16	45°□	2.362 ⁺⁰ _{-0.0018}	0.35
040	FB	2.95	3.82	4.33	3.74	0.28	0.16	45°□	2.362 ^{+0.0018} ₀	0.35
	FC	4.53	3.15	5.51	-	0.35	0.20	45°□	3.740 ⁺⁰ _{-0.0021}	0.37
	FD	3.94	2.28	4.72	-	0.47	0.20	45°□	3.150 ^{+0.0018} ₀	0.35
	FA	3.35	3.54	4.92	4.33	0.35	0.20	45°□	2.756 ^{+0.0018} ₀	0.43
050	FB	3.35	4.72	4.92	4.33	0.35	0.20	45°□	2.756 ^{+0.0018} ₀	0.43
	FC	5.12	3.50	6.30	-	0.39	0.20	45°□	4.331 ^{+0.0021} ₀	0.37
	FD	4.53	2.83	5.51	-	0.57	0.20	45°□	3.543 ^{+0.0021} ₀	0.43
	FA	4.13	3.23	7.09	5.59	0.39	0.24	45°□	4.528 ^{+0.0021} ₀	0.43
063	FB	5.91	4.41	7.09	5.59	0.39	0.24	45°□	4.528 ^{+0.0021} ₀	0.43
	FC	6.50	3.86	7.87	-	0.39	0.20	45°□	5.118 ^{+0.0025} ₀	0.43
	FD	6.50	4.21	7.87	-	0.39	0.20	45°□	5.118 ^{+0.0025} ₀	0.43
	FE	5.12	3.17	6.30	-	0.65	0.20	45°□	4.331 ^{+0.0021} ₀	0.43
075	FA	6.50	4.37	7.87	6.69	0.51	0.24	45°□	5.118 ^{+0.0025} ₀	0.55
	FB	5.12	3.54	6.30	-	0.51	0.24	45°□	4.331 ^{+0.0021} ₀	0.55
090	FA	6.89	4.37	8.27	8.27	0.51	0.24	45°□	5.984 ^{+0.0025} ₀	0.55
	FB	8.46	4.80	9.84	-	0.71	0.24	45°□	7.087 ^{+0.0025} ₀	0.55
	FC	6.50	4.33	7.87	-	0.67	0.24	45°□	5.118 ^{+0.0025} ₀	0.43
	FD	6.89	5.94	8.27	-	0.51	0.24	45°□	5.984 ^{+0.0025} ₀	0.55
105/ 110	FA	9.06	5.16	11.02	10.24	0.59	0.24	45°□	6.693 ^{+0.0025} ₀	0.55
	FB	9.06	7.09	11.02	10.24	0.59	0.24	45°□	6.693 ^{+0.0025} ₀	0.55
130	FA	10.04	5.51	12.60	11.42	0.59	0.24	22.5°□	7.087 ^{+0.0025} ₀	0.63
150	FA	10.04	6.10	12.60	11.42	0.59	0.24	22.5°□	7.087 ^{+0.0025} ₀	0.63

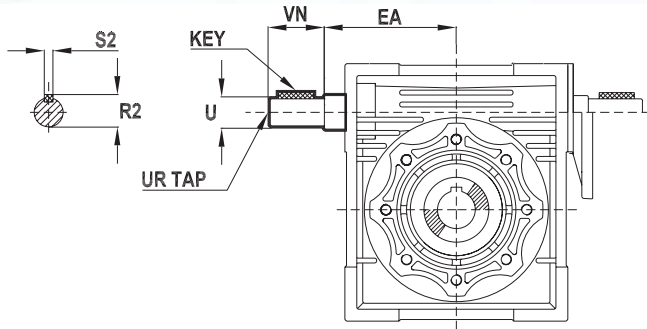
Input Shaft

	030	040	050	063	075	090	105	110	130	150
SB	0.094	0.125	0.1875	0.1875	0.1875	0.1875	0.250	0.250	0.250	0.313
RB	0.42	0.55	0.70	0.83	0.96	0.96	1.24	1.24	1.36	1.51
UB	0.375 ⁺⁰ _{-0.0005}	0.500 ⁺⁰ _{-0.0005}	0.625 ⁺⁰ _{-0.0005}	0.750 ⁺⁰ _{-0.0005}	0.875 ⁺⁰ _{-0.0005}	0.875 ⁺⁰ _{-0.0005}	1.125 ⁺⁰ _{-0.0005}	1.125 ⁺⁰ _{-0.0005}	1.250 ⁺⁰ _{-0.0005}	1.375 ⁺⁰ _{-0.0005}
UB KEY	0.094 x 0.875	0.125 x 0.875	0.1875 x 1.125	0.1875 x 1.50	0.1875 x 1.875	0.1875 x 1.875	0.250 x 2.250	0.250 x 2.250	0.250 x 2.500	0.3125 x 2.875
UR	-	1/4 - 20	1/4 - 20	1/4 - 20	1/4 - 20	1/4 - 20	3/8 - 16	3/8 - 16	1/2 - 13	1/2 - 13
VN	1.18	1.18	1.58	1.97	2.36	2.36	2.76	2.76	3.15	3.15

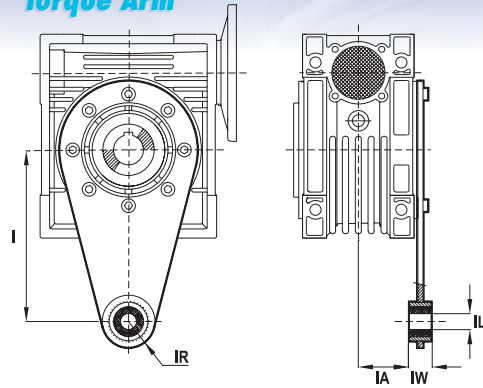


Worm Gear Reducers Accessories

High Speed Extension Shaft



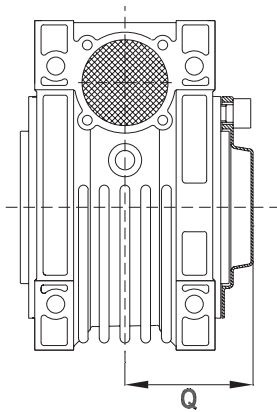
Torque Arm



Size	S2	R2	U	UR TAP	VN	EA	IR	IA	IW
040	2.09	0.500 ^{+0.0005}	1.18	1/4-20	0.13	0.55	0.875	0.125	
050	2.52	0.625 ^{+0.0005}	1.58	1/4-20	0.19	0.70	1.125	0.188	
063	2.95	0.750 ^{+0.0005}	1.97	1/4-20	0.19	0.83	1.500	0.188	
075	3.54	0.875 ^{+0.0005}	2.36	1/4-20	0.19	0.96	1.875	0.188	
090	4.25	0.875 ^{+0.0005}	2.36	1/4-20	0.19	0.96	1.875	0.188	
105/110	5.31	1.125 ^{+0.0005}	2.76	3/8-16	0.25	1.24	2.250	0.250	
130	6.10	1.250 ^{+0.0005}	3.15	1/2-13	0.25	1.36	2.500	0.250	
150	8.27	1.375 ^{+0.0005}	3.15	1/2-13	0.32	1.51	2.875	0.315	

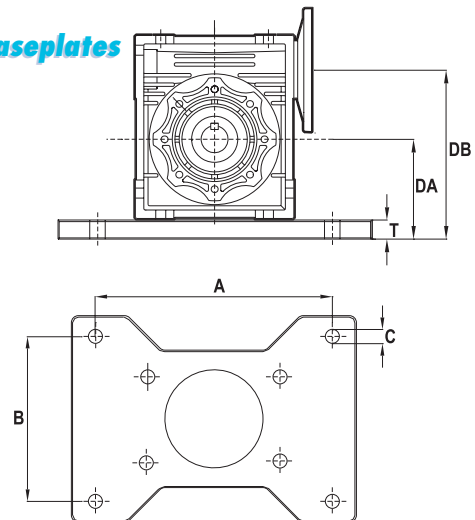
Size	IR	IA	IW	IL
040	3.94	1.24	0.39	0.71
050	3.94	1.52	0.39	0.71
063	5.91	1.93	0.39	0.71
075	7.87	1.87	0.79	1.18
090	7.87	2.26	0.79	1.18
105/110	9.84	2.44	0.98	1.38
130	9.84	2.72	0.98	1.38
150	9.84	3.31	0.98	1.38

Protective Cover



Size	Q
040	1.97
050	2.28
063	2.72
075	2.91
090	3.39
105/110	3.70
130	4.02
150	4.45

Baseplates



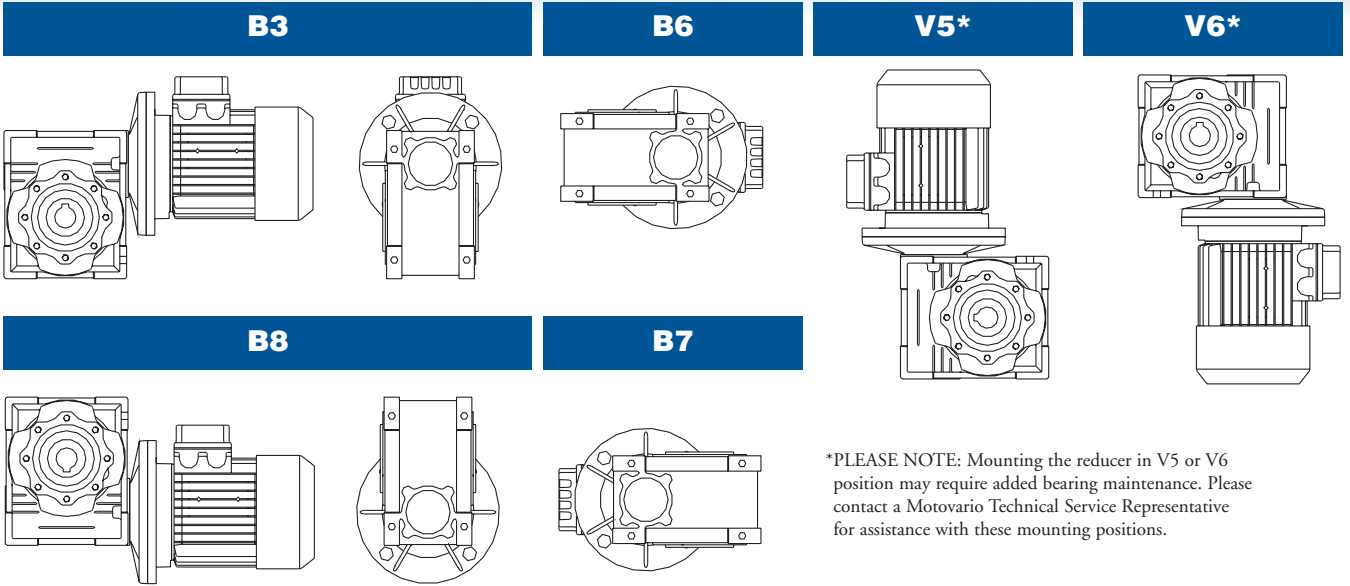
	Size							
	030	040-A	040-B	050	063-A	063-B	075	090
A	4.38	4.38	5.75	6.38	7.06	8.00	8.44	9.50
B	3.31	3.31	4.50	4.69	4.88	5.25	5.88	6.12
C	0.34	0.34	0.41	0.53	0.53	0.53	0.53	0.53
DA	2.25	2.22	2.75	3.00	3.50	3.68	4.00	4.88
DB	3.43	3.79	4.32	4.97	5.98	6.16	6.95	8.42
T	0.68	0.25	0.78	0.64	0.67	0.85	0.61	0.82

Worm Gear Reducer Ratings

Mounting and Availability



Mounting Positions



*PLEASE NOTE: Mounting the reducer in V5 or V6 position may require added bearing maintenance. Please contact a Motovario Technical Service Representative for assistance with these mounting positions.

NEMA Flange Availability

	NEMA Flange	Input Bore Diameter	Available Ratios											
			5	7.5	10	15	20	25	30	40	50	60	80	100
030	48C	0.500	•	•	•	•	•	•	•	•	•	•	•	•
040	56C	0.625	•	•	•	•	•	•	•	•	•	•	•	•
050	56C	0.625	•	•	•	•	•	•	•	•	•	•	•	•
063	56C	0.625					•	•	•	•	•	•	•	•
	140TC	0.875		•	•	•	•	•	•	•				
075	56C	0.625									•	•	•	•
	140TC	0.875				•	•	•	•	•	•			
	180TC	1.125		•	•	•								
090	56C	0.625											•	•
	140TC	0.875						•	•	•	•	•		
	180TC	1.125		•	•	•	•	•	•	•				
105 / 110	140TC	0.875									•	•	•	•
	180TC	1.125					•	•	•	•	•	•		
	210TC	1.375		•	•	•	•							
130	140TC	0.875											•	•
	180TC	1.125							•	•	•	•	•	
	210TC	1.375		•	•	•	•	•	•	•				
150	180TC	1.125							•	•	•	•	•	•
	210TC	1.375				•	•	•	•	•				
	250TC	1.625		•	•	•	•							