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**24-HOUR ASSEMBLY AND SHIPMENT, AND ON-THE-SHELF AVAILABILITY OF OUR MOST SOUGHT AFTER PRODUCTS.**



*"At The Heart Of What Drives Your World"*



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**POWERATIO® 4000 SERIES  
HELICAL INLINE DRIVES**

# **New** *Poweratio*<sup>®</sup> 4000

## **HIGH EFFICIENCY HELICAL IN-LINE DRIVES**

Eight sizes with ratings up to 125HP or 25,000 in-lbs., and ratios from 2.25 up to 3334:1.

### **Ratios**

Double reduction, triple reduction, and quad reduction (compound drives) readily assembled from stock modules. Double reduction up to 50:1, and triple reduction up to 325:1 provide greater ratio capability with fewer components.

### **Mounting**

Foot mounting or flange mounting to interchange with major competitors. shaft Input, c-frame quill input, or gearmotor assemblies to provide complete drive package.

### **Contemporary Design**

Rugged cast iron housings are accurately machined for precision operation, high strength and reliability.

### **Gearing**

Precision crowned gears for smooth operation, high strength and durability.

### **Shafts**

Alloy steel shafts plunge ground for accuracy and fine surface finish.

### **Bearings**

Ball and tapered roller bearings generously sized for long life and high reliability.

### **Seals**

Double lip seals on exposed shafts for enhanced protection and dependable sealing. Single lip seals on motor quill input for cooler running.



**2 New Models!  
See Page I-3**

### **Lubrication**

Filled with high quality gear lubricant at the factory.

### **Motors**

Motors produced by Marathon Electric or Lincoln Motors for high efficiency, reliability and durability. See Section H of Engineering Manual #5.

### **Integral Gear Motors**

Seven sizes available up to 5 HP

**Increased Ratings!  
See Pages I-6 to I-13**



**Poweratio®**  
4000

## HELICAL IN-LINE DRIVES

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Note: This Preliminary Catalog is designed as a supplement to Engineering Manual #5. Refer to Engineering Manual #5 for the following information: AGMA Service Factor & Load Class Information (Section A); Motor Selection (Section H); Lubrication & Installation Instructions (Section R)

### Double



### Flexible Configurations to Fit Your Application

Choose from

- *Double Reduction*  
Ratios from 2.26 to 59.14\*
- *Triple Reduction*  
Ratios from 50/1 to 335/1\*
- *Quad Reduction\*\**  
Ratios from 293/1 to 3334/1\*

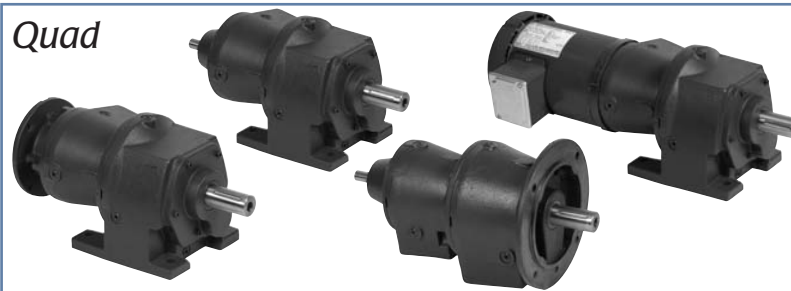
### Triple



Choose an input mounting type

- *Integral Gearmotor\*\**
- *C-Face Input*
- *Shaft Input*

### Quad



Choose an output mounting style

- *Foot Mount*
- *Flange Mount*

\* Ratios vary specific to model  
 \*\* Quad Reduction and Integral Gearmotor dimensions not shown in this catalog. Consult Factory.

*Cleanline™ premium washdown duty and metric versions available, Consult Factory for details and specifications.*

# Selection Procedure

Note: Information in this catalog is intended to be used with information contained in Engineering Manual #5. On pages I-6 to I-13, the Input H.P. and Output Torque Ratings are provided for each model. These rating tables can be used for Reducers and Gearmotors.

## SELECTION FROM UNIT RATING TABLES BY INPUT H.P. OR OUTPUT TORQUE

Determine the actual Input H.P. or Output Torque required, Output Speed, and required Service Factor. Multiply the actual H.P. or torque by the required service factor to obtain the required rating of the Reducer. Refer to the Unit Rating Tables by Model and Output Speed, until you locate the model that meets or exceeds the required H.P. or Torque rating.

The actual service factor can be determined by dividing the unit rating by the actual H.P. or Torque.

Check the Input and Output overhung load ratings, and thrust rating to verify they meet the requirement. Then refer to the dimension tables to check the unit dimensions.

# Service Factors

Load Classification Numbers and Service Factors are used in the selection of Gearmotors and Reducers. The relationship between load class numbers and service factors is shown in Table 2.

The Load Class Numbers are designated for Gearmotors which have a uniform power source (i.e. Electric Motor). They consider the type of load and also the duration of service.

The Service Factors are designated for Reducers and consider other power sources (such as Internal Combustion Engines), as well as the type of load and duration of service.

**TABLE 1 – SERVICE FACTORS**

Prime Mover	Duration of Service Per Day (1)	Driven Machine Load Classification		
		Uniform	Medium Shock	Heavy Shock
Electric Motor	Occasional 1/2 hr.	*	*	1.25
	Intermittent 3 hrs.	*	1.00	1.50
	3 - 10 hours	1.00	1.25	1.75
	Over 10 hours	1.25	1.50	2.00
Electric Motor With Frequent Starts and Stops (2)	Occasional 1/2 hr.	*	1.00	1.50
	Intermittent 3 hrs.	1.00	1.25	1.75
	3 - 10 hours	1.25	1.50	2.00
	Over 10 hours	1.50	1.75	2.25
Multi-Cylinder Internal Combustion Engine	Occasional 1/2 hr.	*	1.00	1.50
	Intermittent 3 hrs.	1.00	1.25	1.75
	3 - 10 hours	1.25	1.50	2.00
	Over 10 hours	1.50	1.75	2.25
Single Cylinder Internal Combustion Engine	Occasional 1/2 hr.	1.00	1.25	1.75
	Intermittent 3 hrs.	1.25	1.50	2.00
	3 - 10 hours	1.50	1.75	2.25
	Over 10 hours	1.75	2.00	2.50
Reversing Service Application		Consult Factory		

\* Unspecified service factors should be 1.0 or as agreed upon by user and manufacturer.

### Explanatory Notes

1. Time specified for intermittent and occasional service refers to total operating time per day.
2. Term "frequent starts and stops" refers to more than 10 starts per hour.

Available motor C-Frame sizes for each reducer model are shown in the dimension tables, and also on page I-24.

## EFFICIENCY

Helical Gearing and Ball or Tapered Roller Bearings provide a drive with very high efficiency. The approximate efficiency is 97.5% per gear stage.

## OVERHUNG LOADS AND THRUST LOADS

Overhung load and thrust ratings are listed in the Selection and Rating Tables. Note that OHL and Thrust Ratings cannot be applied simultaneously. Consult Hub City for applications with combined OHL and thrust load.

## BRAKEMOTORS

Braking torque must not exceed the rated capacity of the unit.

Table 1 and Table 2 list Service Factors and Load Classes for general use.

AGMA Load Classification and Service Factor tables on pages A-5 to A-8 of Engineering Manual #5 provide approximate service factors for various types of machinery. The service factors are based on uniform power source (i.e. electric motor). Use the service factor conversion table on page A-2 to obtain service factors for internal combustion engines.

All the Class Number and Service Factor charts are to be used as general guidelines for assistance in determining the required service factor. Rely on past experience as well. Consult the factory for severe applications, when there are safety considerations, or a need for extra high reliability.

Refer to page A-2 for further information and cautions on the selection of proper service factors.

Occasional starting loads up to 200% of catalog rating are permissible.

**TABLE 2 – LOAD CLASSIFICATION NUMBERS**

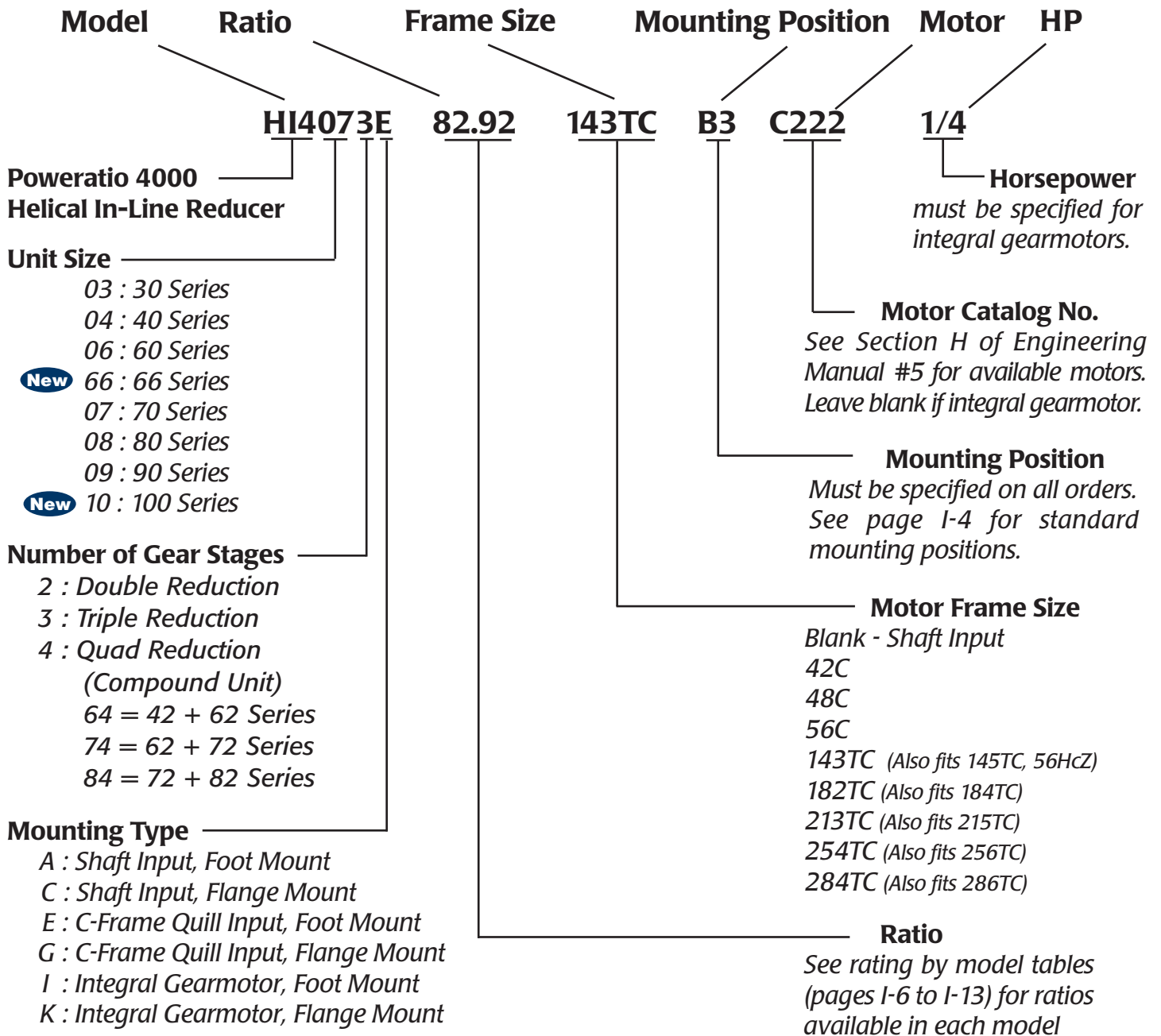
Load Class (S.F.)	Up to 3 hrs. total operation per Day	3 to 10 hrs. total operation per Day	Over 10 hrs. total operation per Day
I (1.0)	Moderate Shock Load	Uniform Load	
II (1.4)	Heavy Shock Load	Moderate Shock Load	Uniform Load
III (2.0)		Heavy Shock Load	Moderate Shock Load

# Descriptions

## Descriptions For Ordering Reducers And Gearmotors

The Mounting position must be specified on all orders, and included in the reducer description. To order Motorized Reducers, simply specify the reducer, indicate the motor description or catalog number and specify “Motorized Assembly”. To order Integral Gearmotors,

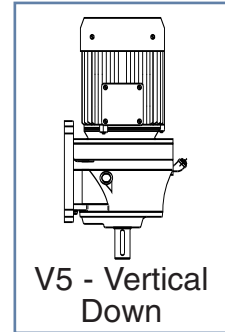
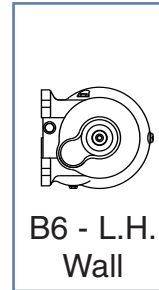
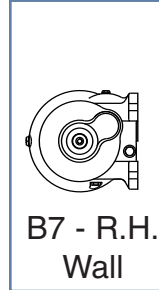
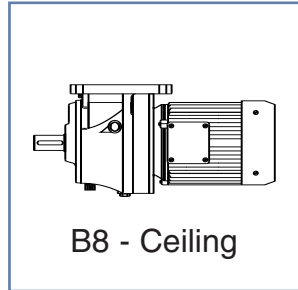
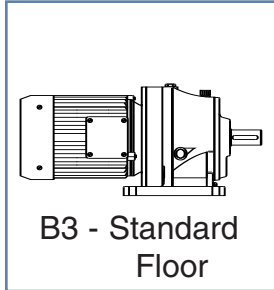
simply specify the reducer, motor horsepower and “Integral Gearmotor”. Integral Gearmotors in this catalog are supplied with 3 phase 230/460v totally enclosed 1750 rpm general purpose motors.



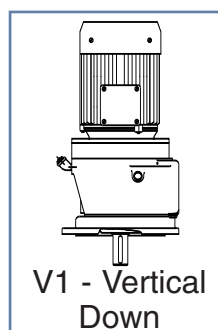
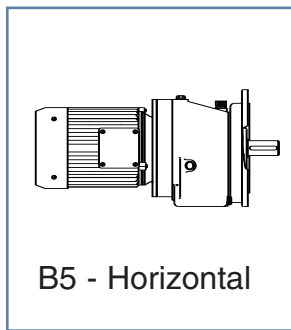
# Mounting Positions

Mounting position must be specified on all orders, and included in the reducer description, so the correct amount of oil is installed at the factory. (Refer to Section R of Engineering Manual #5 for lubrication information.)

## Mounting Positions - Foot Mounted Reducers and Gearmotors



## Mounting Positions - Flange Mounted Reducers and Gearmotors



For Mounting Positions Not Shown, contact Factory.

## Motor Descriptions

Available motors and motor data are listed in Section H. Either specify the catalog number or the complete description: HP, RPM, VOLTS, SINGLE OR THREE PHASE, C-FRAME SIZE, ENCLOSURE GENERAL PURPOSE OR OPTIONAL TYPES: WASHDOWN DUTY, INVERTER DUTY, BRAKEMOTOR.

Standard Integral Gearmotors and Motorized Reducers are assembled at the factory with the conduit box and the conduit opening at the position illustrated in the dimensional section of this catalog. The user may rotate the body of the motor to reposition the conduit box (in 90° increments from original position). The conduit opening may also be repositioned at 90° increments from the original position. Both operations may be performed without disassembling the drive.



## Motorized Reducers & Gearmotors

The Reducer and Motor are assembled at the factory, and filled with the proper quantity of lubricant based on your specified mounting position. Integral Gearmotors in this catalog are supplied with 3 phase 230/460v totally enclosed, fan cooled (TEFC) 1750 rpm general purpose motors. Special integral gearmotors are available. Consult the factory for details.

## Backstops

Backstops are available as factory options. Consult the factory for details.

**IMPORTANT INFORMATION****Please Read Carefully**

*The following  and  information is supplied to you for your protection and to provide you with many years of trouble free and safe operation of your HUB CITY product.*

Read **ALL** instructions prior to operating reducer. Injury to personnel or reducer failure may be caused by improper installation, maintenance or operation.



- Written authorization from HUB CITY is required to operate or use reducers in man lift or people moving devices.
- Check to make certain application does not exceed the allowable load capacities published in the current catalog.
- Buyer shall be solely responsible for determining the adequacy of the product for any and all uses to which Buyer shall apply the product. The application by Buyer shall not be subject to any implied warranty of fitness for a particular purpose.
- For safety, Buyer or User should provide protective guards over all shaft extensions and any moving apparatus mounted thereon. The User is responsible for checking all applicable safety codes in his area and providing suitable guards. Failure to do so may result in bodily injury and/or damage to equipment.
- Hot oil and reducers can cause severe burns. Use extreme care when removing lubrication plugs and vents.
- Make certain that the power supply is disconnected before attempting to service or remove any components. Lock out the power supply and tag it to prevent unexpected application of power.
- Reducers are not to be considered fail safe or self-locking devices. If these features are required, a properly sized, independent holding device should be utilized. Reducers should not be used as a brake.
- Any brakes that are used in conjunction with a reducer must be sized or positioned in such a way so as to not subject the reducer to loads beyond the catalog rating.
- Lifting supports including eyebolts are to be used for vertically lifting the gearbox only and no other associated attachments or motors.
- Use of an oil with an EP additive on units with backstops may prevent proper operation of the backstop. Injury to personnel, damage to the reducer or other equipment may result.
- Overhung loads subject shaft bearings and shafts to stress which may cause premature bearing failure and/or shaft breakage from bending fatigue, if not sized properly.



- Test run unit to verify operation. If the unit tested is a prototype, that unit must be of current production.
- If the speed reducer cannot be located in a clear and dry area with access to adequate cooling air supply, then precautions must be taken to avoid the ingestion of contaminants such as water and the reduction in cooling ability due to exterior contaminants.
- Mounting bolts should be routinely checked to ensure that the unit is firmly anchored for proper operation.

In the event of the resale of any of the goods, in whatever form, Resellers/Buyers will include the following language in a conspicuous place and in a conspicuous manner in a written agreement covering such sale:

The manufacturer makes no warranties or representations, express or implied, by operation of law or otherwise, as to the merchantability or fitness for a particular purpose of the goods sold hereunder. Buyer acknowledges that it alone has determined that the goods purchased hereunder will suitably meet the requirements of their intended use. In no event will the manufacturer be liable for consequential, incidental or other damages.

Resellers/Buyers agree to also include this entire document including the warnings and cautions above in a conspicuous place and in a conspicuous manner in writing to instruct users on the safe usage of the product.

This information should be read together with all other printed information supplied by HUB CITY.

# Ratings @ 1750 RPM Input 1.00 Service Factor

HI4032						
Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
2.39	731	4.63	383	200	105	260
2.87	609	4.20	417	200	105	270
4.02	435	3.49	486	210	105	300
4.86	360	3.17	533	280	105	340
5.84	300	2.86	577	300	105	360
6.67	262	2.44	564	350	105	400
7.06	248	2.51	612	220	105	350
8.17	214	2.00	565	410	105	440
8.66	202	2.17	649	240	105	370
10.09	173	1.86	649	290	105	410
11.21	156	1.77	687	400	105	470
11.96	146	1.55	639	360	105	450
14.33	122	1.37	680	420	105	470
17.59	99	1.15	700	420	105	470
19.67	89	1.05	715	420	105	470
20.49	85	1.03	730	420	105	470
24.28	72	0.87	732	420	105	470
28.12	62	0.75	726	420	105	470
33.32	53	0.63	726	420	105	470
37.85	46	0.56	735	420	105	470
43.10	41	0.50	739	420	105	470
51.93	34	0.41	730	420	105	470
59.14	30	0.36	730	420	105	470
HI4042						
2.63	665	11.2	1020	530	140	610
2.95	593	10.4	1060	550	140	630
3.31	529	9.61	1100	570	140	650
3.72	470	9.10	1170	580	140	660
4.21	416	8.79	1280	590	140	650
4.78	366	7.75	1280	620	140	690
5.47	320	6.77	1280	650	140	730
5.87	298	6.31	1280	680	140	780
6.13	285	6.79	1440	710	140	840
6.86	255	6.16	1460	740	140	880
7.70	227	5.56	1480	770	140	920
8.67	202	5.17	1550	790	140	950
9.80	179	4.75	1610	820	140	980
11.14	157	4.41	1700	850	140	1010
12.74	137	3.95	1740	890	140	1060
13.67	128	3.77	1780	920	140	1100
16.66	105	3.13	1800	980	140	1250
20.77	84	2.52	1810	1050	140	1250
25.04	70	2.10	1820	1150	140	1250
28.79	61	1.84	1830	1150	140	1250
36.56	48	1.46	1840	1150	140	1250
44.10	40	1.21	1850	1150	140	1250
50.47	35	1.01	1770	1150	140	1250
HI4043						
60.54	28.9	0.90	1850	1150	105	1250
72.63	24.1	0.75	1850	1150	105	1250
79.17	22.1	0.69	1850	1150	105	1250
92.74	18.9	0.59	1850	1150	105	1250
100.76	17.4	0.54	1850	1150	105	1250
115.15	15.2	0.47	1850	1150	105	1250
121.28	14.4	0.45	1850	1150	105	1250
133.14	13.1	0.41	1850	1150	105	1250
154.35	11.3	0.35	1850	1150	105	1250
176.40	9.9	0.31	1850	1150	105	1250
203.96	8.6	0.27	1850	1150	105	1250
239.42	7.3	0.23	1850	1150	105	1250

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).

\* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)

All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.

The point of application of OHL is considered to be applied at the midpoint of shaft extension.

OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.

At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

Note: Quad reduction ratings shown for reference only.

Quad reduction units are manufactured to order.

Consult Factory for dimensional information



# Ratings @ 1750 RPM Input 1.00 Service Factor

HI4062						
Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
2.57	681	18.6	1650	960	200	890
3.08	568	16.5	1760	1010	200	930
3.90	449	13.9	1880	1090	200	1000
4.52	387	12.6	1970	1140	200	1050
5.98	293	15.8	3260	1080	200	870
7.16	244	13.5	3340	1180	200	990
9.06	193	11.0	3450	1290	200	1110
10.52	166	10.1	3680	1340	200	1140
13.75	127	8.22	3910	1470	200	1260
16.43	107	7.04	4000	1560	200	1370
17.50	100	6.63	4010	1600	200	1400
20.00	88	5.83	4030	1600	200	1400
21.47	82	5.44	4040	1600	200	1400
25.00	70	4.69	4050	1600	200	1400
27.14	64	4.33	4060	1600	200	1400
29.62	59	3.97	4070	1600	200	1400
32.50	54	3.64	4090	1600	200	1400
35.91	48.7	3.30	4100	1600	200	1400
45.00	38.9	2.64	4110	1600	200	1400
51.25	34.1	2.33	4120	1600	200	1400
HI4063						
55.79	31.4	2.18	4120	1600	140	1400
61.69	28.4	1.97	4120	1600	140	1400
68.00	25.7	1.79	4120	1600	140	1400
75.71	23.1	1.62	4140	1600	140	1400
84.76	20.6	1.44	4140	1600	140	1400
92.29	19.0	1.33	4140	1600	140	1400
102.22	17.1	1.20	4140	1600	140	1400
115.03	15.2	1.06	4140	1600	140	1400
138.73	12.6	0.88	4140	1600	140	1400
149.23	11.7	0.82	4140	1600	140	1400
159.46	11.0	0.77	4140	1600	140	1400
180.00	9.7	0.68	4140	1600	140	1400
206.00	8.5	0.59	4140	1600	140	1400
244.29	7.2	0.50	4140	1600	140	1400
279.57	6.3	0.44	4140	1600	140	1400
HI4064						
293.47	5.96	0.43	4140	1600	140	1400
318.50	5.49	0.39	4140	1600	140	1400
357.70	4.89	0.35	4140	1600	140	1400
399.90	4.38	0.31	4140	1600	140	1400
457.48	3.83	0.27	4140	1600	140	1400
537.72	3.25	0.23	4140	1600	140	1400
598.25	2.93	0.21	4140	1600	140	1400
679.78	2.57	0.18	4140	1600	140	1400
785.00	2.23	0.16	4140	1600	140	1400
899.32	1.95	0.14	4140	1600	140	1400
1034	1.69	0.12	4140	1600	140	1400
1197	1.46	0.10	4140	1600	140	1400
1370	1.28	0.09	4140	1600	140	1400
1584	1.10	0.08	4140	1600	140	1400
1812	0.97	0.07	4140	1600	140	1400
1985	0.88	0.06	4140	1600	140	1400
2260	0.77	0.06	4140	1600	140	1400
2587	0.68	0.05	4140	1600	140	1400

Reducer Ratings

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).

\* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)

All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.

The point of application of OHL is considered to be applied at the midpoint of shaft extension.

OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.

At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

Note: Quad reduction ratings shown for reference only.  
Quad reduction units are manufactured to order.  
Consult Factory for dimensional information

# Ratings @1750 RPM Input 1.00 Service Factor

HI4662						
Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
2.41	726	26.9	2240	1230	200	1160
2.71	646	25.2	2360	1270	200	1190
3.05	574	23.5	2480	1310	200	1220
3.30	530	22.6	2580	1330	200	1240
3.73	469	20.9	2690	1370	200	1260
4.05	432	19.7	2760	1420	200	1320
4.61	380	18.0	2870	1470	200	1360
5.28	331	16.3	2970	1540	200	1430
5.88	298	18.1	3680	1550	200	1430
6.61	265	16.4	3750	1640	200	1500
7.44	235	15.3	3930	1690	200	1500
8.05	217	15.0	4180	1700	200	1500
9.10	192	13.7	4300	1700	200	1500
9.89	177	13.0	4430	1700	200	1500
11.25	156	12.0	4660	1700	200	1500
12.88	136	10.8	4810	1700	200	1500
15.61	112	9.32	5030	1700	200	1500
18.25	95.9	8.24	5200	1700	200	1500
21.65	80.8	6.99	5230	1700	200	1500
26.19	66.8	5.81	5260	1700	200	1500
32.53	53.8	4.71	5300	1700	200	1500
38.39	45.6	4.01	5320	1700	200	1500
46.38	37.7	3.33	5340	1700	200	1500
51.57	33.9	3.00	5350	1700	200	1500
HI4663						
56.30	31.1	2.74	5220	1700	140	1500
60.40	29.0	2.63	5370	1700	140	1500
65.07	26.9	2.44	5370	1700	140	1500
73.94	23.7	2.15	5370	1700	140	1500
84.59	20.7	1.88	5370	1700	140	1500
91.77	19.1	1.73	5370	1700	140	1500
110.67	15.8	1.43	5370	1700	140	1500
127.22	13.8	1.25	5370	1700	140	1500
137.88	12.7	1.15	5370	1700	140	1500
161.57	10.8	1.00	5370	1700	140	1500
191.13	9.2	0.83	5370	1700	140	1500
223.03	7.8	0.71	5370	1700	140	1500
242.75	7.2	0.65	5370	1700	140	1500
292.80	6.0	0.54	5370	1700	140	1500
335.09	5.2	0.47	5370	1700	140	1500
HI4664						
357.93	4.89	0.45	5370	1700	140	1500
414.47	4.22	0.39	5370	1700	140	1500
444.68	3.94	0.36	5370	1700	140	1500
489.11	3.58	0.33	5370	1700	140	1500
524.75	3.33	0.31	5370	1700	140	1500
574.33	3.05	0.28	5370	1700	140	1500
655.84	2.67	0.25	5370	1700	140	1500
753.85	2.32	0.21	5370	1700	140	1500
797.27	2.19	0.20	5370	1700	140	1500
859.20	2.04	0.19	5370	1700	140	1500
963.16	1.82	0.17	5370	1700	140	1500
1071	1.63	0.15	5370	1700	140	1500
1189	1.47	0.14	5370	1700	140	1500
1335	1.31	0.12	5370	1700	140	1500
1485	1.18	0.11	5370	1700	140	1500
1693	1.03	0.10	5370	1700	140	1500
1886	0.93	0.09	5370	1700	140	1500
2045	0.86	0.08	5370	1700	140	1500
2341	0.75	0.07	5370	1700	140	1500
2603	0.67	0.06	5370	1700	140	1500

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).  
 \* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)  
 All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.  
 The point of application of OHL is considered to be applied at the midpoint of shaft extension.  
 OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.  
 At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

Note: Quad reduction ratings shown for reference only.  
 Quad reduction units are manufactured to order.  
 Consult Factory for dimensional information



# Ratings @1750 RPM Input 1.00 Service Factor

Reducer Ratings

HI4072						
Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
2.39	732.2	28.6	2360	1280	385	1400
2.67	655.4	28.5	2630	1340	385	1500
2.99	585.3	27.2	2810	1350	385	1580
3.22	543.5	25.5	2840	1350	385	1580
3.62	483.4	23.0	2880	1450	385	1580
3.92	446.4	21.8	2960	1550	385	1580
4.44	394.1	20.0	3070	1620	385	1580
5.06	345.8	18.3	3200	1640	385	1580
6.01	291.2	25.2	5230	1685	385	1580
6.71	260.8	23.3	5400	1685	385	1580
7.50	233.3	21.4	5560	1685	385	1580
8.09	216.3	20.3	5680	1685	385	1580
9.09	192.5	18.6	5860	1710	385	1580
9.85	177.7	17.6	6000	1710	385	1580
11.15	157.0	15.7	6050	1780	385	1580
12.71	137.7	14.5	6370	1830	385	1580
17.85	98.0	11.2	6900	2030	385	1620
21.10	82.9	10.0	7260	2120	385	1620
25.44	68.8	8.25	7260	2150	385	1620
31.51	55.5	6.66	7260	2200	385	1620
37.11	47.2	5.66	7260	2230	385	1620
44.75	39.1	4.69	7260	2240	385	1620
49.72	35.2	4.22	7260	2240	385	1620
HI4073						
50.87	34.4	4.22	7260	2240	140	1620
55.74	31.4	3.85	7260	2240	140	1620
57.81	30.3	3.71	7260	2240	140	1620
63.01	27.8	3.40	7260	2240	140	1620
66.13	26.5	3.24	7260	2240	140	1620
70.95	24.7	3.02	7260	2240	140	1620
71.61	24.4	2.99	7260	2240	140	1620
81.92	21.4	2.62	7260	2240	140	1620
86.48	20.2	2.48	7260	2240	140	1620
87.89	19.9	2.44	7260	2240	140	1620
107.12	16.3	2.00	7260	2240	140	1620
130.00	13.5	1.65	7260	2240	140	1620
133.53	13.1	1.61	7260	2240	140	1620
149.43	11.7	1.44	7260	2240	140	1620
161.04	10.9	1.33	7260	2240	140	1620
185.10	9.5	1.16	7260	2240	140	1620
189.79	9.2	1.13	7260	2240	140	1620
228.92	7.6	0.94	7260	2240	140	1620
235.09	7.4	0.91	7260	2240	140	1620
261.99	6.7	0.82	7260	2240	140	1620
283.56	6.2	0.76	7260	2240	140	1620
324.52	5.4	0.66	7260	2240	140	1620
HI4074						
344.84	5.1	0.62	7260	2240	200	1620
356.92	4.9	0.60	7260	2240	200	1620
400.36	4.4	0.54	7260	2240	200	1620
445.13	3.9	0.48	7260	2240	200	1620
546.12	3.2	0.39	7260	2240	200	1620
649.47	2.7	0.33	7260	2240	200	1620
803.08	2.2	0.27	7260	2240	200	1620
855.21	2.0	0.25	7260	2240	200	1620
1007.34	1.74	0.21	7260	2240	200	1620
1099.10	1.59	0.20	7260	2240	200	1620

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).  
 \* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)  
 All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.  
 The point of application of OHL is considered to be applied at the midpoint of shaft extension.  
 OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.  
 At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

Note: Quad reduction ratings shown for reference only.  
 Quad reduction units are manufactured to order.  
 Consult Factory for dimensional information

# Ratings @ 1750 RPM Input 1.00 Service Factor

<b>HI4074</b>						
Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
1206.15	1.45	0.18	7260	2240	200	1620
1472.57	1.19	0.15	7260	2240	200	1620
1670.06	1.05	0.13	7260	2240	200	1620
1785.51	0.98	0.12	7260	2240	200	1620
2237.54	0.78	0.10	7260	2240	200	1620
<b>HI4082</b>						
2.39	731	53.8	4450	1820	595	1850
2.67	655	50.5	4660	1830	595	1850
2.99	585	47.2	4880	1840	595	1850
3.22	543	44.9	5000	1840	595	1850
3.62	483	41.8	5230	1840	595	1850
3.77	464	40.4	5270	1850	595	1850
4.26	411	37.3	5490	1860	595	1850
5.06	346	32.9	5750	1880	595	1850
6.01	291	45.5	9450	1900	595	1850
6.71	261	42.6	9890	1980	595	1850
7.50	233	40.0	10360	2080	595	1850
8.09	216	38.0	10630	2100	595	1850
9.09	193	35.3	11100	2140	595	1850
9.46	185	34.2	11200	2150	595	1850
10.69	164	31.5	11650	2200	595	1850
12.71	138	27.7	12190	2350	595	1850
17.85	98	21.4	13200	2500	595	1950
21.10	83	18.2	13260	2750	595	1950
25.44	69	15.1	13300	3000	595	2400
31.51	56	12.2	13330	3400	595	2400
44.75	39	8.65	13380	3800	595	2400
49.72	35	7.80	13400	3800	595	2400
<b>HI4083</b>						
53.50	32.7	7.56	13700	3800	200	2400
57.11	30.6	7.09	13700	3800	200	2400
66.27	26.4	6.11	13700	3800	200	2400
69.95	25.0	5.79	13700	3800	200	2400
83.58	20.9	4.84	13700	3800	200	2400
86.65	20.2	4.67	13700	3800	200	2400
89.03	19.7	4.55	13700	3800	200	2400
103.53	16.9	3.91	13700	3800	200	2400
110.28	15.9	3.67	13700	3800	200	2400
126.03	13.9	3.21	13700	3800	200	2400
135.30	12.9	2.99	13700	3800	200	2400
138.08	12.7	2.93	13700	3800	200	2400
150.66	11.6	2.69	13700	3800	200	2400
157.54	11.1	2.57	13700	3800	200	2400
165.33	10.6	2.45	13700	3800	200	2400
171.04	10.2	2.37	13700	3800	200	2400
182.68	9.6	2.22	13700	3800	200	2400
186.62	9.4	2.17	13700	3800	200	2400
204.80	8.5	1.98	13700	3800	200	2400
226.28	7.7	1.79	13700	3800	200	2400
228.92	7.6	1.77	13700	3800	200	2400
260.72	6.7	1.55	13700	3800	200	2400
283.57	6.2	1.43	13700	3800	200	2400
322.95	5.4	1.25	13700	3800	200	2400
<b>HI4084</b>						
310.23	5.6	1.30	13700	3800	385	2400
351.29	5.0	1.15	13700	3800	385	2400
400.30	4.4	1.01	13700	3800	385	2400
445.16	3.9	0.91	13700	3800	385	2400
536.67	3.3	0.75	13700	3800	385	2400

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).  
 \* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)  
 All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.  
 The point of application of OHL is considered to be applied at the midpoint of shaft extension.  
 OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.  
 At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

Note: Quad reduction ratings shown for reference only.  
 Quad reduction units are manufactured to order.  
 Consult Factory for dimensional information



# Ratings @ 1750 RPM Input 1.00 Service Factor

HI4084 cont.						
Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
646.98	2.7	0.63	13700	3800	385	2400
801.43	2.2	0.50	13700	3800	385	2400
992.73	1.76	0.41	13700	3800	385	2400
1169.33	1.50	0.35	13700	3800	385	2400
1264.75	1.38	0.32	13700	3800	385	2400
1410.13	1.24	0.29	13700	3800	385	2400
1566.66	1.12	0.26	13700	3800	385	2400
1845.34	0.95	0.22	13700	3800	385	2400
2225.37	0.79	0.18	13700	3800	385	2400
2472.38	0.71	0.16	13700	3800	385	2400
HI4092						
2.24	781.3	103.3	8000	3370	950	2200
2.53	691.7	96.4	8430	3370	950	2270
3.15	555.6	84.8	9230	3370	950	2290
3.60	486.1	77.9	9700	3370	950	2290
4.60	380.4	66.1	10510	3370	950	2290
5.36	326.5	56.7	10510	3370	950	2290
5.92	295.6	80.6	16500	3370	950	2290
6.69	261.6	75.7	17500	3370	950	2290
8.34	209.8	62.4	18000	3370	950	2290
9.52	183.8	55.3	18200	3370	950	2290
12.17	143.8	45.6	19200	3370	950	2290
14.17	123.5	41.6	20400	3370	950	2360
18.25	95.9	35.0	22100	3370	950	2740
20.03	87.4	33.4	23100	3370	950	2850
24.55	71.3	29.5	25000	3370	950	3240
27.50	63.6	24.3	23100	3370	950	3420
31.10	56.3	21.5	23100	3370	950	3440
38.29	45.7	17.5	23200	3370	950	3440
44.93	38.9	15.0	23300	3370	950	3440
59.86	29.2	11.3	23400	3370	950	3440
67.06	26.1	10.1	23400	3370	950	3440
HI4093						
57.41	30.5	13.7	26600	4460	385	3440
62.19	28.1	12.6	26600	4460	385	3440
63.37	27.6	12.4	26600	4460	385	3440
70.42	24.9	11.2	26600	4460	385	3440
80.24	21.8	9.79	26600	4460	385	3440
89.01	19.7	8.83	26600	4460	385	3440
105.23	16.6	7.47	26600	4460	385	3440
112.72	15.5	6.97	26600	4460	385	3440
126.87	13.8	6.19	26600	4460	385	3440
133.26	13.1	5.90	26600	4460	385	3440
157.15	11.1	5.00	26600	4460	385	3440
160.66	10.9	4.89	26600	4460	385	3440
185.09	9.5	4.25	26600	4460	385	3440
199.01	8.8	3.95	26600	4460	385	3440
223.22	7.8	3.52	26600	4460	385	3440
234.41	7.5	3.35	26600	4460	385	3440
248.00	7.1	3.17	26600	4460	385	3440
282.68	6.2	2.78	26600	4460	385	3440
314.06	5.6	2.50	26600	4460	385	3440
HI4094						
357.43	4.9	2.20	26600	4460	595	3440
438.20	4.0	1.79	26600	4460	595	3440
490.71	3.6	1.60	26600	4460	595	3440
554.88	3.2	1.42	26600	4460	595	3440
631.04	2.8	1.25	26600	4460	595	3440

Reducer Ratings

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).  
 \* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)  
 All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.  
 The point of application of OHL is considered to be applied at the midpoint of shaft extension.  
 OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.  
 At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

Note: Quad reduction ratings shown for reference only.  
 Quad reduction units are manufactured to order.  
 Consult Factory for dimensional information



# Ratings @ 1750 RPM Input 1.00 Service Factor

## HI4094 cont.

Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
656.02	2.7	1.20	26600	4460	595	3440
807.76	2.2	0.97	26600	4460	595	3440
979.66	1.79	0.80	26600	4460	595	3440
1206.25	1.45	0.65	26600	4460	595	3440
1391.56	1.26	0.56	26600	4460	595	3440
1713.43	1.02	0.46	26600	4460	595	3440
1903.62	0.92	0.41	26600	4460	595	3440
2112.65	0.83	0.37	26600	4460	595	3440
2679.05	0.65	0.29	26600	4460	595	3440
3000.92	0.58	0.26	26600	4460	595	3440
3334.02	0.52	0.24	26600	4460	595	3440

## HI4102

2.26	774.3	125.0	9770	2725	950	2790
2.58	678.3	125.0	11150	2735	950	2790
2.96	592.0	125.0	12780	2745	950	2790
3.79	461.5	125.1	16400	2755	950	2790
4.60	380.8	121.5	19300	2570	950	2790
5.43	322.6	102.9	19300	2700	950	2790
6.01	291.4	125.2	26000	2750	950	2790
6.86	255.2	110.9	26300	2785	950	2790
7.85	222.8	103.1	28000	2790	950	2790
10.08	173.6	100.4	35000	2800	950	2790
12.21	143.3	90.2	38100	2810	950	2790
14.41	121.4	76.5	38100	3050	950	3040
18.12	96.6	60.8	38100	3350	950	3040
20.04	87.3	55.0	38100	3500	950	3300
22.30	78.5	49.4	38100	3700	950	3750
25.01	70.0	44.1	38100	3900	950	3750
28.33	61.8	38.9	38100	4200	950	3750
32.48	53.9	33.9	38100	4350	950	5320
34.97	50.0	31.5	38100	4550	950	5350

## HI4103

34.56	50.6	32.6	38100	4550	385	5350
38.59	45.3	29.2	38100	4570	385	5350
39.63	44.2	28.4	38100	4850	385	5350
43.15	40.6	26.1	38100	5000	385	5350
46.55	37.6	24.2	38100	5100	385	5350
49.47	35.4	22.7	38100	5300	385	5350
52.30	33.5	21.5	38100	5450	385	5350
53.37	32.8	21.1	38100	5500	385	5350
54.42	32.2	20.7	38100	5550	385	5350
59.97	29.2	18.8	38100	5750	385	5350
61.51	28.5	18.3	38100	6000	385	5350
62.40	28.0	18.0	38100	6000	385	5350
70.52	24.8	16.0	38100	6300	385	5350
73.12	23.9	15.4	38100	6300	385	5350
83.84	20.9	13.4	38100	6500	385	5350
102.70	17.0	11.0	38100	6500	385	5350
117.76	14.9	9.56	38100	6500	385	5350
121.43	14.4	9.27	38100	6500	385	5350
139.23	12.6	8.08	38100	6500	385	5350
146.39	12.0	7.69	38100	6500	385	5350
167.85	10.4	6.71	38100	6500	385	5350
181.32	9.7	6.21	38100	6500	385	5350
207.90	8.4	5.41	38100	6500	385	5350
257.56	6.8	4.37	38100	6500	385	5350
286.15	6.1	3.93	38100	6500	385	5350
295.31	5.9	3.81	38100	6500	385	5350
328.09	5.3	3.43	38100	6500	385	5350

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).

\* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)

All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.

The point of application of OHL is considered to be applied at the midpoint of shaft extension.

OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.

At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

Note: Quad reduction ratings shown for reference only.

Quad reduction units are manufactured to order.

Consult Factory for dimensional information

# Ratings @ 1750 RPM Input 1.00 Service Factor

HI4104						
Ratio	Output Speed	Input H.P.	Output Torque	Output OHL	Input OHL	Output Thrust
357.56	4.9	3.15	38100	6500	595	5350
397.95	4.4	2.83	38100	6500	595	5350
446.41	3.9	2.52	38100	6500	595	5350
527.77	3.3	2.13	38100	6500	595	5350
636.26	2.8	1.77	38100	6500	595	5350
702.58	2.5	1.60	38100	6500	595	5350
826.21	2.1	1.36	38100	6500	595	5350
896.70	2.0	1.26	38100	6500	595	5350
997.98	1.75	1.13	38100	6500	595	5350
1023.44	1.71	1.10	38100	6500	595	5350
1119.52	1.56	1.01	38100	6500	595	5350
1268.07	1.38	0.89	38100	6500	595	5350
1408.82	1.24	0.80	38100	6500	595	5350
1453.75	1.20	0.77	38100	6500	595	5350
1615.11	1.08	0.70	38100	6500	595	5350

\* Integral Gearmotors - Specify Mounting Type I or K, and motor horsepower (See page I-3).  
 \* Motorized Reducers - Specify Mounting Type E or G, and Motor Part number (See Section H #5 Engineering Manual)  
 All torque values listed in inch-pounds, all overhung load and thrust load values listed in pounds.  
 The point of application of OHL is considered to be applied at the midpoint of shaft extension.  
 OHL and thrust ratings cannot be applied simultaneously. Consult the factory for applications with combined OHL and thrust load.  
 At speeds above 1750 RPM, units may become thermally limited. For extended operation, limit HP to 1750 RPM rating.

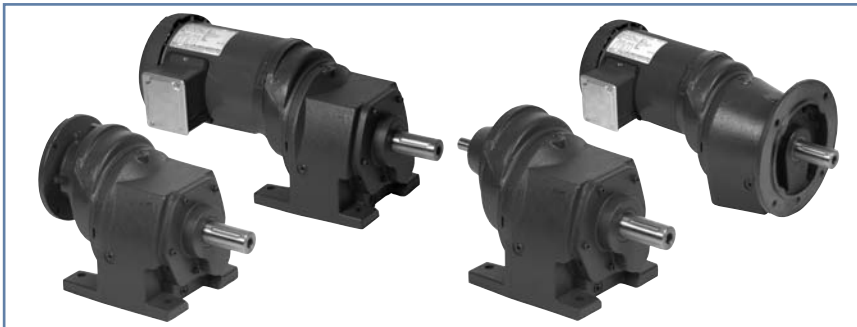
Note: Quad reduction ratings shown for reference only. Quad reduction units are manufactured to order. Consult Factory for dimensional information

Reducer Ratings

## Reducers



**Double Reduction**  
 See Pages I-14 thru I-17



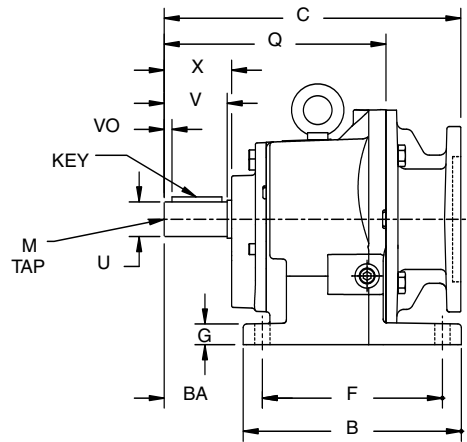
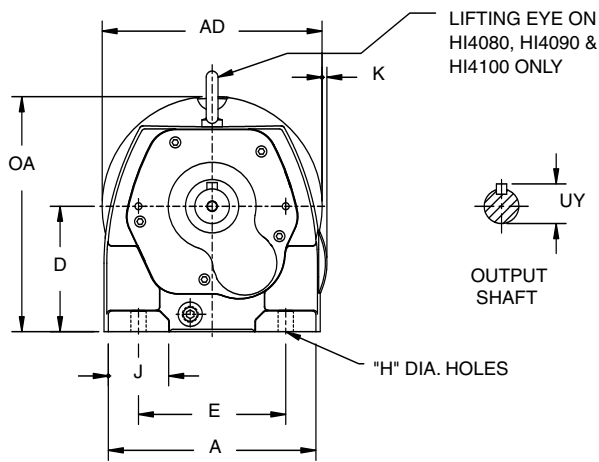
**Triple Reduction**  
 See Pages I-18 thru I-20



**Quad Reduction**  
 Not Shown in this catalog,  
 Contact Hub City for  
 Dimensions

# Double Reduction

DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.  
CERTIFIED PRINTS ARE AVAILABLE UPON REQUEST.



Dimensions are inch/ mm

**Gearcase**

Model	A	AD	B	BA	D	E	F	G	H	J	K	OA	Q
HI4032E	5.20	5.64	5.08	2.28	2.95 <sup>+0</sup> <sub>-.02</sub>	4.33	4.33	0.45	0.39	0.93	0.31	5.71	6.96
	132	143	129	58	75 <sup>+0</sup> <sub>-.5</sub>	110	110	11	10	24	8	145	177
HI4042E	5.72	6.61	6.30	2.95	3.54 <sup>+0</sup> <sub>-.02</sub>	4.33	5.12	0.59	0.39	1.40	0.29	6.68	7.29
	145	168	160	75	90 <sup>+0</sup> <sub>-.5</sub>	110	130	15	10	35	7	170	185
HI4062E	7.48	7.93	7.87	3.94	4.53 <sup>+0</sup> <sub>-.02</sub>	5.32	6.50	0.75	0.53	2.18	N/A	8.48	8.40
	190	201	200	100	115 <sup>+0</sup> <sub>-.5</sub>	135	165	19	14	55	N/A	215	213
HI4662E	8.14	8.50	9.13	3.94	5.12 <sup>+0</sup> <sub>-.02</sub>	5.91	7.68	0.82	0.53	2.39	0.24	9.08	9.44
	207	216	232	100	130 <sup>+0</sup> <sub>-.5</sub>	150	195	21	14	61	6	231	240
HI4072E	8.66	9.97	9.65	4.53	5.51 <sup>+0</sup> <sub>-.02</sub>	6.69	8.07	0.98	0.69	2.16	N/A	10.47	10.79
	220	253	245	115	140 <sup>+0</sup> <sub>-.5</sub>	170	205	25	18	55	N/A	266	274
HI4082E	11.34	11.96	12.59	5.51	7.09 <sup>+0</sup> <sub>-.02</sub>	8.47	10.24	1.11	0.75	2.93	N/A	13.04	12.99
	288	304	320	140	180 <sup>+0</sup> <sub>-.5</sub>	215	260	28	19	74	N/A	331	330
HI4092E	13.42	14.00	14.37	6.30	8.86 <sup>+0</sup> <sub>-.02</sub>	9.84	12.21	1.38	0.91	3.55	0.45	15.84	16.41
	341	356	365	160	225 <sup>+0</sup> <sub>-.5</sub>	250	310	35	23	90	11	402	417
HI4102E	15.25	16.08	17.32	7.28	9.84 <sup>+0</sup> <sub>-.02</sub>	11.42	14.57	1.50	1.02	4.00	0.35	16.78	19.00
	387	408	440	185	250 <sup>+0</sup> <sub>-.5</sub>	290	370	38	26	102	9	426	483

**Output Shaft \***

Model	U	UY	V	VO	X	KEY	M
HI4032E	0.750 <sup>+0</sup> <sub>-.001</sub>	0.82	1.93	0.25	1.98	3/16 x 3/16 x 1-1/16	1/4-20 x 0.63
HI4042E	1.000 <sup>+0</sup> <sub>-.001</sub>	1.10	N/A	0.40	2.12	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4062E	1.375 <sup>+0</sup> <sub>-.001</sub>	1.51	N/A	0.44	2.83	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4662E	1.375 <sup>+0</sup> <sub>-.001</sub>	1.51	2.76	0.44	2.94	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4072E	1.625 <sup>+0</sup> <sub>-.001</sub>	1.78	3.15	0.45	3.27	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4082E	2.125 <sup>+0</sup> <sub>-.001</sub>	2.34	3.94	0.64	4.06	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4092E	2.375 <sup>+0</sup> <sub>-.001</sub>	2.64	4.72	0.70	4.95	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4102E	2.875 <sup>+0</sup> <sub>-.001</sub>	3.19	5.51	0.67	5.62	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Motor Compatibility - NEMA**

Model	NEMA							
	56C	143TC	182TC	213TC	254TC	284TC	324TC	364TC
HI4032E	C	9.76	-	-	-	-	-	-
HI4042E	C	9.90	9.90	11.21	-	-	-	-
HI4062E	C	11.10	11.10	12.12	12.12	-	-	-
HI4662E	C	12.14	12.14	13.16	13.16	-	-	-
HI4072E	C	14.15	14.15	14.83	14.83	-	-	-
HI4082E	C	-	-	18.45	18.45	18.45	19.00	-
HI4092E	C	-	-	20.89	20.89	20.89	20.89	22.15
HI4102E	C	-	-	23.49	23.49	23.49	23.49	24.75

\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.

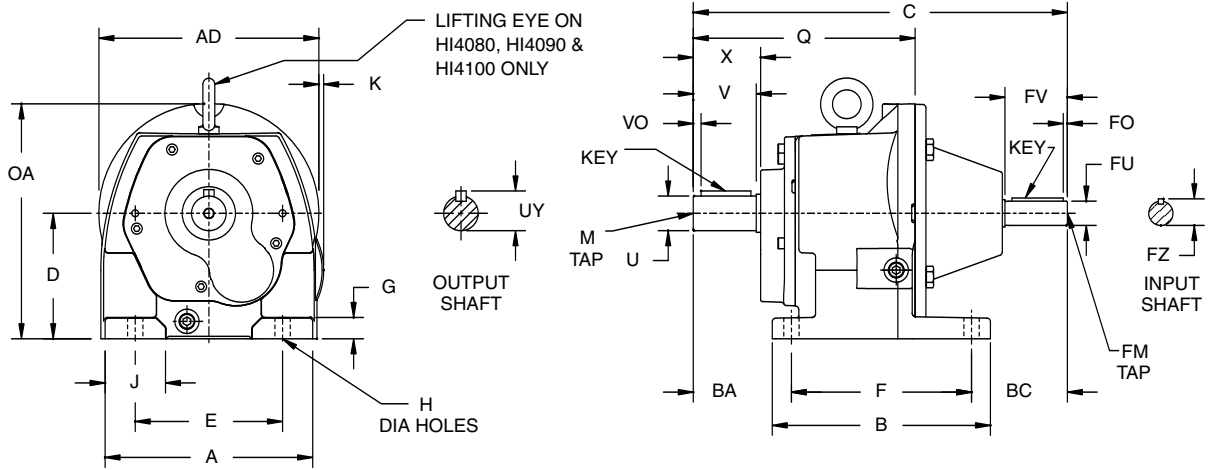


For safety and to comply with local and national safety codes, the purchaser or user must provide protective guards over all shaft extensions and devices mounted thereon.



DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.  
CERTIFIED PRINTS ARE AVAILABLE UPON REQUEST.

# Double Reduction



Dimensions are inch/ mm

**Gearcase**

Model	A	AD	B	BA	D	E	F	G	H	J	K	OA	Q
HI4032A	5.20	5.64	5.08	2.28	2.95 <sup>+0</sup> <sub>-.02</sub>	4.33	4.33	0.45	0.39	0.93	0.31	5.71	6.96
	132	143	129	58	75 <sup>+0</sup> <sub>-.5</sub>	110	110	11	10	24	8	145	177
HI4042A	5.72	6.61	6.30	2.95	3.54 <sup>+0</sup> <sub>-.02</sub>	4.33	5.12	0.59	0.39	1.40	0.29	6.68	7.29
	145	168	160	75	90 <sup>+0</sup> <sub>-.5</sub>	110	130	15	10	35	7	170	185
HI4062A	7.48	7.93	7.87	3.94	4.53 <sup>+0</sup> <sub>-.02</sub>	5.32	6.50	0.75	0.53	2.18	N/A	8.48	8.40
	190	201	200	100	115 <sup>+0</sup> <sub>-.5</sub>	135	165	19	14	55	N/A	215	213
HI4662A	8.14	8.50	9.13	3.94	5.12 <sup>+0</sup> <sub>-.02</sub>	5.91	7.68	0.82	0.53	2.39	0.24	9.08	9.44
	207	216	232	100	130 <sup>+0</sup> <sub>-.5</sub>	150	195	21	14	61	6	231	240
HI4072A	8.66	9.97	9.65	4.53	5.51 <sup>+0</sup> <sub>-.02</sub>	6.69	8.07	0.98	0.69	2.16	N/A	10.47	10.79
	220	253	245	115	140 <sup>+0</sup> <sub>-.5</sub>	170	205	25	18	55	N/A	266	274
HI4082A	11.34	11.96	12.59	5.51	7.09 <sup>+0</sup> <sub>-.02</sub>	8.47	10.24	1.11	0.75	2.93	N/A	13.04	12.99
	288	304	320	140	180 <sup>+0</sup> <sub>-.5</sub>	215	260	28	19	74	N/A	331	330
HI4092A	13.42	14.00	14.37	6.30	8.86 <sup>+0</sup> <sub>-.02</sub>	9.84	12.21	1.38	0.91	3.55	0.45	15.84	16.41
	341	356	365	160	225 <sup>+0</sup> <sub>-.5</sub>	250	310	35	23	90	11	402	417
HI4102A	15.25	16.08	17.32	7.28	9.84 <sup>+0</sup> <sub>-.02</sub>	11.42	14.57	1.50	1.02	4.00	0.35	16.78	19.00
	387	408	440	185	250 <sup>+0</sup> <sub>-.5</sub>	290	370	38	26	102	9	426	483

**Output Shaft \***

Model	U	UY	V	VO	X	KEY	M
HI4032A	0.750 <sup>+0</sup> <sub>-.001</sub>	0.82	1.93	0.25	1.98	3/16 x 3/16 x 1-1/16	1/4-20 x 0.63
HI4042A	1.000 <sup>+0</sup> <sub>-.001</sub>	1.10	N/A	0.40	2.12	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4062A	1.375 <sup>+0</sup> <sub>-.001</sub>	1.51	N/A	0.44	2.83	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4662A	1.375 <sup>+0</sup> <sub>-.001</sub>	1.51	2.76	0.44	2.94	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4072A	1.625 <sup>+0</sup> <sub>-.001</sub>	1.78	3.15	0.45	3.27	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4082A	2.125 <sup>+0</sup> <sub>-.001</sub>	2.34	3.94	0.64	4.06	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4092A	2.375 <sup>+0</sup> <sub>-.001</sub>	2.64	4.72	0.70	4.95	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4102A	2.875 <sup>+0</sup> <sub>-.001</sub>	3.19	5.51	0.67	5.62	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Input Shaft \***

Model	FU	FZ	FV	FO	KEY	FM
HI4032A	0.625 <sup>+0</sup> <sub>-.001</sub>	0.69	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4042A	0.750 <sup>+0</sup> <sub>-.001</sub>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4062A	0.875 <sup>+0</sup> <sub>-.001</sub>	0.95	2.25	N/A	3/16 x 3/16 x 2	1/4-20 x 0.75
HI4662A	0.875 <sup>+0</sup> <sub>-.001</sub>	0.95	2.25	N/A	3/16 x 3/16 x 2	1/4-20 x 0.75
HI4072A	1.125 <sup>+0</sup> <sub>-.001</sub>	1.23	2.63	N/A	1/4 x 1/4 x 2-1/2	3/8-16 x 1.00
HI4082A	1.375 <sup>+0</sup> <sub>-.001</sub>	1.51	3.15	0.35	5/16 x 5/16 x 2-3/8	1/2-13 x 1.41
HI4092A	1.875 <sup>+0</sup> <sub>-.001</sub>	2.08	3.75	N/A	1/2 x 1/2 x 3-1/4	5/8-18 x 1.50
HI4102A	1.875 <sup>+0</sup> <sub>-.001</sub>	2.08	3.75	N/A	1/2 x 1/2 x 3-1/4	5/8-18 x 1.50

**Gearcase/Input**

Model	BC	C
HI4032A	4.66	11.27
HI4042A	3.56	11.63
HI4062A	3.45	13.89
HI4662A	3.31	14.93
HI4072A	5.04	17.64
HI4082A	5.82	21.57
HI4092A	6.82	25.33
HI4102A	6.07	27.92

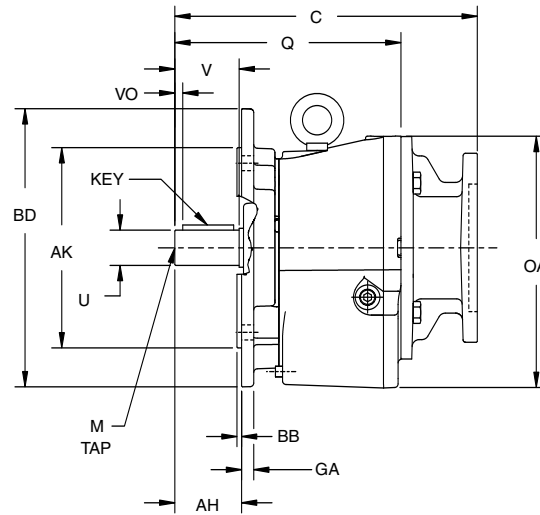
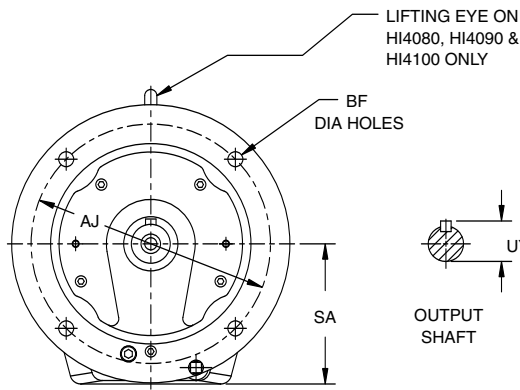
\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.



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# Double Reduction

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Dimensions are inch/ mm

**Gearcase**

Model	OA	Q	SA
HI4032G	6.30	6.96	3.15
	160	177	80
HI4042G	7.22	7.29	4.04
	183	185	103
HI4062G	8.92	8.40	4.96
	227	213	126
HI4662G	9.71	9.44	5.75
	247	240	146
HI4072G	10.93	10.79	5.94
	278	274	151
HI4082G	13.05	12.99	7.08
	331	330	180
HI4092G	16.42	16.41	9.45
	417	417	240
HI4102G	17.98	19.00	11.02
	457	483	280

**Output Shaft**

AH	AJ	AK	BB	BD	BF	GA
1.92	5.12	4.331 <sup>+0.0023</sup> <sub>-.0024</sub>	0.14	6.30	0.39	0.38
49	130	110 <sup>+0.054</sup> <sub>-.054</sub>	4	160	10	10
1.97	6.50	5.118 <sup>+0.002</sup> <sub>-.003</sub>	0.14	7.90	0.47	0.43
50	165	130 <sup>+0.054</sup> <sub>-.054</sub>	4	200	12	11
2.76	8.46	7.087 <sup>+0.0004</sup> <sub>-.0029</sub>	0.16	9.84	0.53	0.43
70	215	180 <sup>+0.064</sup> <sub>-.064</sub>	4	250	14	11
2.76	8.46	7.087 <sup>+0.0004</sup> <sub>-.0029</sub>	0.16	9.84	0.53	0.43
70	215	180 <sup>+0.064</sup> <sub>-.064</sub>	4	250	14	11
3.15	10.43	9.055 <sup>+0.0001</sup> <sub>-.0027</sub>	0.16	11.81	0.53	0.59
80	265	230 <sup>+0.072</sup> <sub>-.072</sub>	4	300	14	15
3.93	11.81	9.843 <sup>+0.0005</sup> <sub>-.0025</sub>	0.20	13.78	0.69	0.70
100	300	250 <sup>+0.051</sup> <sub>-.051</sub>	5	350	18	18
4.72	15.75	13.780 <sup>+0.0005</sup> <sub>-.0032</sub>	0.19	17.74	0.75	1.02
120	400	350 <sup>+0.070</sup> <sub>-.070</sub>	5	451	19	26
5.51	15.75	13.780 <sup>+0.0005</sup> <sub>-.0032</sub>	0.20	17.72	0.75	1.00
140	400	350 <sup>+0.070</sup> <sub>-.070</sub>	5	450	19	25.4

**Output Shaft \* - Cont.**

Model	U	UY	V	VO	KEY	M
HI4032G	0.750 <sup>+0.001</sup> <sub>-.001</sub>	0.82	1.93	0.25	3/16 x 3/16 x 1-1/16	1/4-20 x 0.63
HI4042G	1.000 <sup>+0.001</sup> <sub>-.001</sub>	1.10	N/A	0.40	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4062G	1.375 <sup>+0.001</sup> <sub>-.001</sub>	1.51	N/A	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4662G	1.375 <sup>+0.001</sup> <sub>-.001</sub>	1.51	2.76	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4072G	1.625 <sup>+0.001</sup> <sub>-.001</sub>	1.78	3.15	0.45	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4082G	2.125 <sup>+0.001</sup> <sub>-.001</sub>	2.34	3.94	0.64	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4092G	2.375 <sup>+0.001</sup> <sub>-.001</sub>	2.64	4.72	0.70	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4102G	2.875 <sup>+0.001</sup> <sub>-.001</sub>	3.19	5.51	0.67	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Motor Compatibility - NEMA**

Model	NEMA								
	56C	143TC	182TC	213TC	254TC	284TC	324TC	364TC	
HI4032G	C	9.76	-	-	-	-	-	-	-
HI4042G	C	9.90	9.90	11.21	-	-	-	-	-
HI4062G	C	11.10	11.10	12.12	12.12	-	-	-	-
HI4662G	C	12.14	12.14	13.16	13.16	-	-	-	-
HI4072G	C	14.15	14.15	14.83	14.83	14.83	-	-	-
HI4082G	C	-	-	18.45	18.45	18.45	19.00	-	-
HI4092G	C	-	-	20.89	20.89	20.89	20.89	22.15	22.15
HI4102G	C	-	-	23.49	23.49	23.49	23.49	24.75	24.75

\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.

Dimensions subject to change without notice

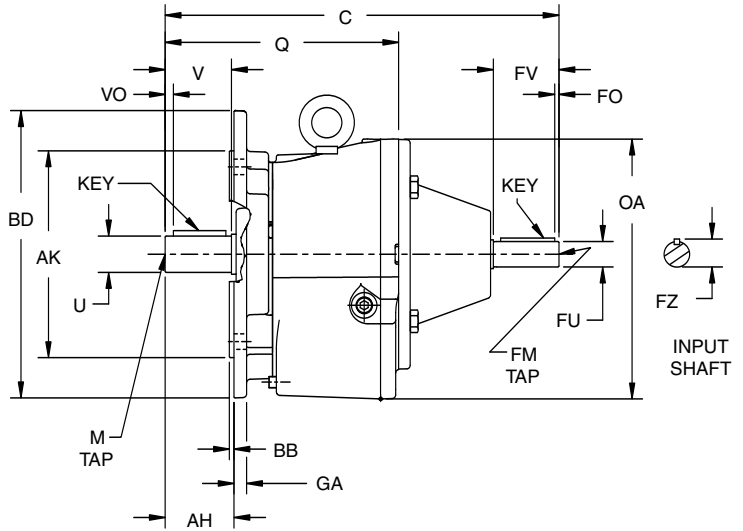
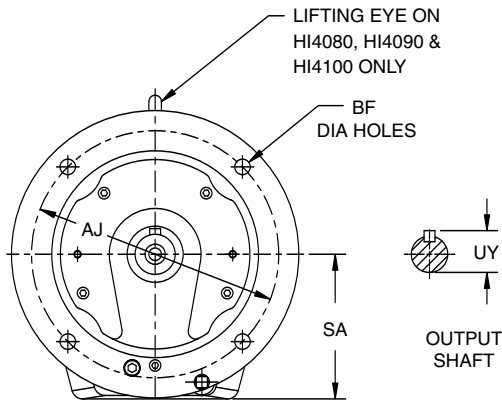


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# Double Reduction



Dimensions are inch/ mm

**Gearcase**

Model	OA	Q	SA
HI4032C	6.30	6.96	3.15
	160	177	80
HI4042C	7.22	7.29	4.04
	183	185	103
HI4062C	8.92	8.40	4.96
	227	213	126
HI4662C	9.71	9.44	5.75
	247	240	146
HI4072C	10.93	10.79	5.94
	278	274	151
HI4082C	13.05	12.99	7.08
	331	330	180
HI4092C	16.42	16.41	9.45
	417	417	240
HI4102C	17.98	19.00	11.02
	457	483	280

**Output Shaft**

AH	AJ	AK	BB	BD	BF	GA
1.92	5.12	4.331 <sup>-.0003</sup>	0.14	6.30	0.39	0.38
49	130	110 <sup>+.0</sup>	4	160	10	10
1.97	6.50	5.118 <sup>+.0</sup>	0.14	7.90	0.47	0.43
50	165	130 <sup>-.003</sup>	4	200	12	11
2.76	8.46	7.087 <sup>-.0004</sup>	0.16	9.84	0.53	0.43
70	215	180 <sup>+.0029</sup>	4	250	14	11
2.76	8.46	7.087 <sup>-.0004</sup>	0.16	9.84	0.53	0.43
70	215	180 <sup>+.0</sup>	4	250	14	11
3.15	10.43	9.055 <sup>+.0001</sup>	0.16	11.81	0.53	0.59
80	265	230 <sup>+.0</sup>	4	300	14	15
3.93	11.81	9.843 <sup>-.0005</sup>	0.20	13.78	0.69	0.70
100	300	250 <sup>-.0025</sup>	5	350	18	18
4.72	15.75	13.780 <sup>-.0005</sup>	0.19	17.74	0.75	1.02
120	400	350 <sup>+.0</sup>	5	451	19	26
5.51	15.75	13.780 <sup>-.0005</sup>	0.20	17.72	0.75	1.00
140	400	350 <sup>+.0</sup>	5	450	19	25.4

**Output Shaft \* - Cont.**

Model	U	UY	V	VO	KEY	M
HI4032C	0.750 <sup>+.0</sup>	0.82	1.93	0.25	3/16 x 3/16 x 1-1/16	1/4-20 x 0.63
HI4042C	1.000 <sup>+.0</sup>	1.10	N/A	0.40	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4062C	1.375 <sup>+.0</sup>	1.51	N/A	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4662C	1.375 <sup>+.0</sup>	1.51	2.76	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4072C	1.625 <sup>+.0</sup>	1.78	3.15	0.45	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4082C	2.125 <sup>+.0</sup>	2.34	3.94	0.64	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4092C	2.375 <sup>+.0</sup>	2.64	4.72	0.70	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4102C	2.875 <sup>+.0</sup>	3.19	5.51	0.67	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Input Shaft \***

Model	FU	FZ	FV	FO	KEY	FM
HI4032C	0.625 <sup>+.0</sup>	0.69	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4042C	0.750 <sup>+.0</sup>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4062C	0.875 <sup>+.0</sup>	0.95	2.25	N/A	3/16 x 3/16 x 2	1/4-20 x 0.75
HI4662C	0.875 <sup>+.0</sup>	0.95	2.25	N/A	3/16 x 3/16 x 2	1/4-20 x 0.75
HI4072C	1.125 <sup>+.0</sup>	1.23	2.63	N/A	1/4 x 1/4 x 2-1/2	3/8-16 x 1.00
HI4082C	1.375 <sup>+.0</sup>	1.51	3.15	0.35	5/16 x 5/16 x 2-3/8	1/2-13 x 1.41
HI4092C	1.875 <sup>+.0</sup>	2.08	3.75	N/A	1/2 x 1/2 x 3-1/4	5/8-18 x 1.50
HI4102C	1.875 <sup>+.0</sup>	2.08	3.75	N/A	1/2 x 1/2 x 3-1/4	5/8-18 x 1.50

**Gearcase/Input**

Model	C
HI4032C	11.27
HI4042C	11.63
HI4062C	13.89
HI4662C	14.93
HI4072C	17.64
HI4082C	21.57
HI4092C	25.33
HI4102C	27.92

\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.

Dimensions subject to change without notice



For safety and to comply with local and national safety codes, the purchaser or user must provide protective guards over all shaft extensions and devices mounted thereon.

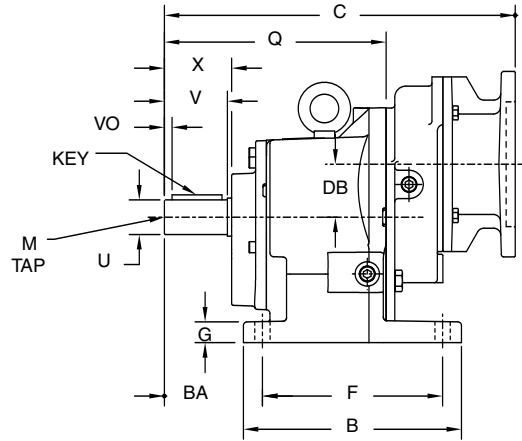
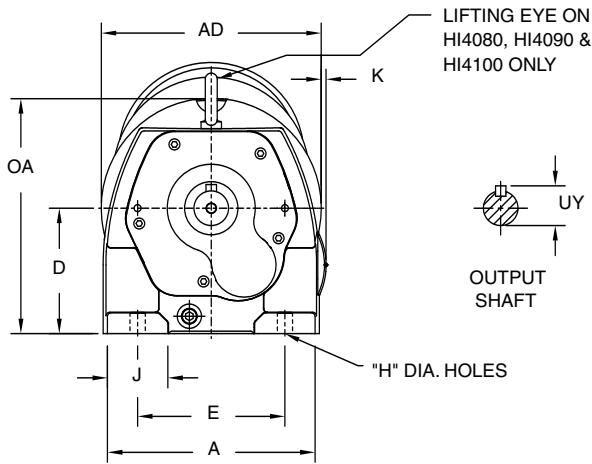
CALL: (605) 225-0360



FAX: (605) 225-0567

# Triple Reduction

DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.  
CERTIFIED PRINTS ARE AVAILABLE UPON REQUEST.



Dimensions are inch/ mm

**Gearcase**

Model	A	AD	B	BA	D	DB	E	F	G	H	J	K	OA	Q
HI4043E	5.72	6.61	6.30	2.95	3.54 <sup>+0</sup> <sub>-.02</sub>	1.50	4.33	5.12	0.59	0.39	1.40	0.29	6.68	7.29
	145	168	160	75	90 <sup>+0</sup> <sub>-.5</sub>	38	110	130	15	10	35	7	170	185
HI4063E	7.48	7.93	7.87	3.94	4.53 <sup>+0</sup> <sub>-.02</sub>	1.91	5.32	6.50	0.75	0.53	2.18	N/A	8.48	8.40
	190	201	200	100	115 <sup>+0</sup> <sub>-.5</sub>	49	135	165	19	14	55	N/A	215	213
HI4663E	8.14	8.50	9.13	3.94	5.12 <sup>+0</sup> <sub>-.02</sub>	1.91	5.91	7.68	0.82	0.53	2.39	0.24	9.08	9.44
	207	216	232	100	130 <sup>+0</sup> <sub>-.5</sub>	49	150	195	21	14	61	6	231	240
HI4073E	8.66	9.97	9.65	4.53	5.51 <sup>+0</sup> <sub>-.02</sub>	1.91	6.69	8.07	0.98	0.69	2.16	N/A	10.47	10.79
	220	253	245	115	140 <sup>+0</sup> <sub>-.5</sub>	49	170	205	25	18	55	N/A	266	274
HI4083E	11.34	11.96	12.59	5.51	7.09 <sup>+0</sup> <sub>-.02</sub>	2.36	8.47	10.24	1.11	0.75	2.93	N/A	13.04	12.99
	288	304	320	140	180 <sup>+0</sup> <sub>-.5</sub>	60	215	260	28	19	74	N/A	331	330
HI4093E	13.42	14.00	14.37	6.30	8.86 <sup>+0</sup> <sub>-.02</sub>	2.87	9.84	12.21	1.38	0.91	3.55	0.45	15.84	16.41
	341	356	365	160	225 <sup>+0</sup> <sub>-.5</sub>	73	250	310	35	23	90	11	402	417
HI4103E	15.25	16.08	17.32	7.28	9.84 <sup>+0</sup> <sub>-.02</sub>	3.39	11.42	14.57	1.50	1.02	4.00	0.35	16.78	19.00
	387	408	440	185	250 <sup>+0</sup> <sub>-.5</sub>	86	290	370	38	26	102	9	426	483

**Output Shaft \***

Model	U	UY	V	VO	X	KEY	M
HI4043E	1.000 <sup>+0</sup> <sub>-.001</sub>	1.10	N/A	0.40	2.12	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4063E	1.375 <sup>+0</sup> <sub>-.001</sub>	1.51	N/A	0.44	2.83	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4663E	1.375 <sup>+0</sup> <sub>-.001</sub>	1.51	2.76	0.44	2.94	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4073E	1.625 <sup>+0</sup> <sub>-.001</sub>	1.78	3.15	0.45	3.27	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4083E	2.125 <sup>+0</sup> <sub>-.001</sub>	2.34	3.94	0.64	4.06	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4093E	2.375 <sup>+0</sup> <sub>-.001</sub>	2.64	4.72	0.70	4.95	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4103E	2.875 <sup>+0</sup> <sub>-.001</sub>	3.19	5.51	0.67	5.62	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Motor Compatibility - NEMA**

Model	NEMA					
	56C	143TC	182TC	213TC	254TC	284TC
HI4043E	C	10.68	-	-	-	-
HI4063E	C	13.06	13.06	-	-	-
HI4663E	C	14.10	14.10	-	-	-
HI4073E	C	14.97	14.97	-	-	-
HI4083E	C	16.87	16.87	17.89	-	-
HI4093E	C	22.30	22.30	22.98	22.98	22.98
HI4103E	C	-	-	28.34	28.34	28.89

\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.

Dimensions subject to change without notice

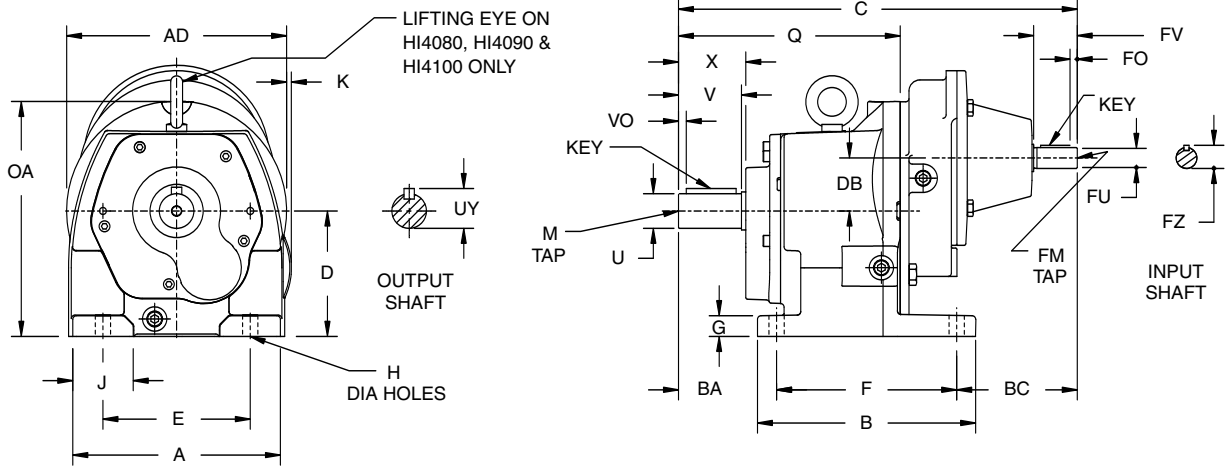


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# Triple Reduction



Dimensions are inch/ mm

**Gearcase**

Model	A	AD	B	BA	D	DB	E	F	G	H	J	K	OA	Q
HI4043A	5.72	6.61	6.30	2.95	3.54 <sup>+0</sup> <sub>-0.02</sub>	1.50	4.33	5.12	0.59	0.39	1.40	0.29	6.68	7.29
	145	168	160	75	90 <sup>+0</sup> <sub>-0.5</sub>	38	110	130	15	10	35	7	170	185
HI4063A	7.48	7.93	7.87	3.94	4.53 <sup>+0</sup> <sub>-0.02</sub>	1.91	5.32	6.50	0.75	0.53	2.18	N/A	8.48	8.40
	190	201	200	100	115 <sup>+0</sup> <sub>-0.5</sub>	49	135	165	19	14	55	N/A	215	213
HI4663A	8.14	8.50	9.13	3.94	5.12 <sup>+0</sup> <sub>-0.02</sub>	1.91	5.91	7.68	0.82	0.53	2.39	0.24	9.08	9.44
	207	216	232	100	130 <sup>+0</sup> <sub>-0.5</sub>	49	150	195	21	14	61	6	231	240
HI4073A	8.66	9.97	9.65	4.53	5.51 <sup>+0</sup> <sub>-0.02</sub>	1.91	6.69	8.07	0.98	0.69	2.16	N/A	10.47	10.79
	220	253	245	115	140 <sup>+0</sup> <sub>-0.5</sub>	49	170	205	25	18	55	N/A	266	274
HI4083A	11.34	11.96	12.59	5.51	7.09 <sup>+0</sup> <sub>-0.02</sub>	2.36	8.47	10.24	1.11	0.75	2.93	N/A	13.04	12.99
	288	304	320	140	180 <sup>+0</sup> <sub>-0.5</sub>	60	215	260	28	19	74	N/A	331	330
HI4093A	13.42	14.00	14.37	6.30	8.86 <sup>+0</sup> <sub>-0.02</sub>	2.87	9.84	12.21	1.38	0.91	3.55	0.45	15.84	16.41
	341	356	365	160	225 <sup>+0</sup> <sub>-0.5</sub>	73	250	310	35	23	90	11	402	417
HI4103A	15.25	16.08	17.32	7.28	9.84 <sup>+0</sup> <sub>-0.02</sub>	3.39	11.42	14.57	1.50	1.02	4.00	0.35	16.78	19.00
	387	408	440	185	250 <sup>+0</sup> <sub>-0.5</sub>	86	290	370	38	26	102	9	426	483

**Output Shaft \***

Model	U	UY	V	VO	X	KEY	M
HI4043A	1.000 <sup>+0</sup> <sub>-0.001</sub>	1.10	N/A	0.40	2.12	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4063A	1.375 <sup>+0</sup> <sub>-0.001</sub>	1.51	N/A	0.44	2.83	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4663A	1.375 <sup>+0</sup> <sub>-0.001</sub>	1.51	2.76	0.44	2.94	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4073A	1.625 <sup>+0</sup> <sub>-0.001</sub>	1.78	3.15	0.45	3.27	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4083A	2.125 <sup>+0</sup> <sub>-0.001</sub>	2.34	3.94	0.64	4.06	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4093A	2.375 <sup>+0</sup> <sub>-0.001</sub>	2.64	4.72	0.70	4.95	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4103A	2.875 <sup>+0</sup> <sub>-0.001</sub>	3.19	5.51	0.67	5.62	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Input Shaft \***

Model	FU	FZ	FV	FO	KEY	FM
HI4043A	0.625 <sup>+0</sup> <sub>-0.001</sub>	0.69	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4063A	0.750 <sup>+0</sup> <sub>-0.001</sub>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4663A	0.750 <sup>+0</sup> <sub>-0.001</sub>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4073A	0.750 <sup>+0</sup> <sub>-0.001</sub>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4083A	0.875 <sup>+0</sup> <sub>-0.001</sub>	0.95	2.25	N/A	3/16 x 3/16 x 2	1/4-20 x 0.75
HI4093A	1.125 <sup>+0</sup> <sub>-0.001</sub>	1.23	2.63	N/A	1/4 x 1/4 x 2-3/8	3/8-16 x 1.00
HI4103A	1.375 <sup>+0</sup> <sub>-0.001</sub>	1.51	3.15	0.35	5/16 x 5/16 x 2-3/8	1/2-13 x 1.41

**Gearcase/Input**

Model	BC	C
HI4043A	4.12	12.19
HI4063A	4.35	14.78
HI4663A	4.21	15.82
HI4073A	4.10	16.70
HI4083A	3.92	19.66
HI4093A	7.29	25.79
HI4103A	9.62	31.46

\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.

Dimensions subject to change without notice



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CALL: (605) 225-0360

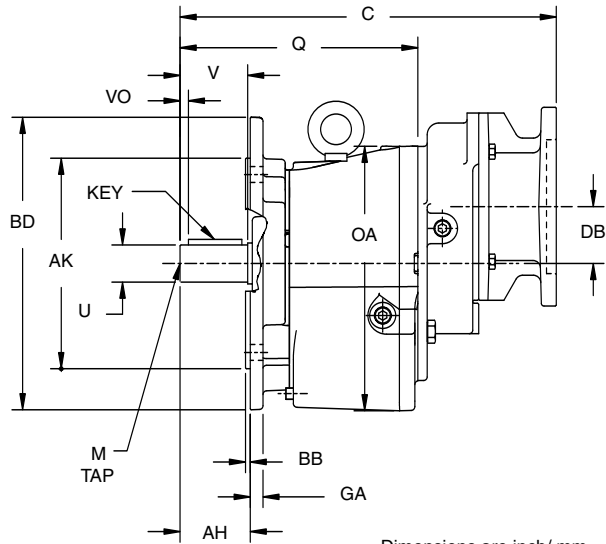
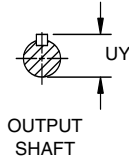
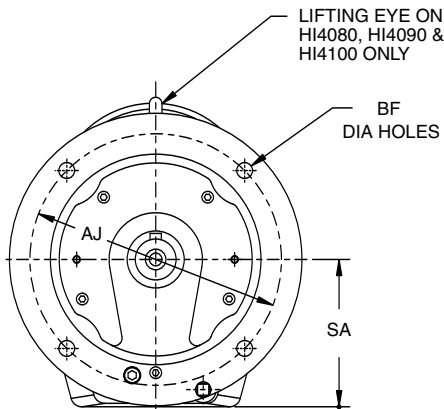


FAX: (605) 225-0567

I-19

# Triple Reduction

DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.  
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Dimensions are inch/ mm

**Gearcase**

Model	OA	Q	SA	DB
HI4043G	7.22	7.29	4.04	1.50
	183	185	103	38
HI4063G	8.92	8.40	4.96	1.91
	227	213	126	49
HI4663G	9.71	9.44	5.75	1.91
	247	240	146	49
HI4073G	10.93	10.79	5.94	1.91
	278	274	151	49
HI4083G	13.05	12.99	7.08	2.36
	331	330	180	60
HI4093G	16.42	16.41	9.45	2.87
	417	417	240	73
HI4103G	17.98	19.00	11.02	3.39
	457	483	280	86

**Output Shaft**

AH	AJ	AK	BB	BD	BF	GA
1.97	6.50	5.118 <sup>+0</sup> / <sub>-.002</sub>	0.14	7.90	0.47	0.43
50	165	130 <sup>-.003</sup> / <sub>-.054</sub>	4	200	12	11
2.76	8.46	7.087 <sup>-.0004</sup> / <sub>-.0029</sub>	0.16	9.84	0.53	0.43
70	215	180 <sup>+0</sup> / <sub>-.064</sub>	4	250	14	11
2.76	8.46	7.087 <sup>-.0004</sup> / <sub>-.0029</sub>	0.16	9.84	0.53	0.43
70	215	180 <sup>+0</sup> / <sub>-.064</sub>	4	250	14	11
3.15	10.43	9.055 <sup>+0.0001</sup> / <sub>-.0027</sub>	0.16	11.81	0.53	0.59
80	265	230 <sup>+0</sup> / <sub>-.072</sub>	4	300	14	15
3.93	11.81	9.843 <sup>-.0005</sup> / <sub>-.0025</sub>	0.20	13.78	0.69	0.70
100	300	250 <sup>+0</sup> / <sub>-.051</sub>	5	350	18	18
4.72	15.75	13.780 <sup>-.0005</sup> / <sub>-.0032</sub>	0.19	17.74	0.75	1.02
120	400	350 <sup>+0</sup> / <sub>-.070</sub>	5	451	19	26
5.51	15.75	13.780 <sup>-.0005</sup> / <sub>-.0032</sub>	0.20	17.72	0.75	1.00
140	400	350 <sup>+0</sup> / <sub>-.070</sub>	5	450	19	25.4

**Output Shaft \* - Cont.**

Model	U	UY	V	VO	KEY	M
HI4043G	1.000 <sup>+0</sup> / <sub>-.001</sub>	1.10	N/A	0.40	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4063G	1.375 <sup>+0</sup> / <sub>-.001</sub>	1.51	N/A	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4663G	1.375 <sup>+0</sup> / <sub>-.001</sub>	1.51	2.76	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4073G	1.625 <sup>+0</sup> / <sub>-.001</sub>	1.78	3.15	0.45	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4083G	2.125 <sup>+0</sup> / <sub>-.001</sub>	2.34	3.94	0.64	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4093G	2.375 <sup>+0</sup> / <sub>-.001</sub>	2.64	4.72	0.70	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4103G	2.875 <sup>+0</sup> / <sub>-.001</sub>	3.19	5.51	0.67	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Motor Compatibility - NEMA**

Model	NEMA					
	56C	143TC	182TC	213TC	254TC	284TC
HI4043G	C	10.68	-	-	-	-
HI4063G	C	13.06	13.06	-	-	-
HI4663G	C	14.10	14.10	-	-	-
HI4073G	C	14.97	14.97	-	-	-
HI4083G	C	16.87	16.87	17.89	-	-
HI4093G	C	22.30	22.30	22.98	22.98	22.98
HI4103G	C	-	-	28.34	28.34	28.34

\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.

Dimensions subject to change without notice

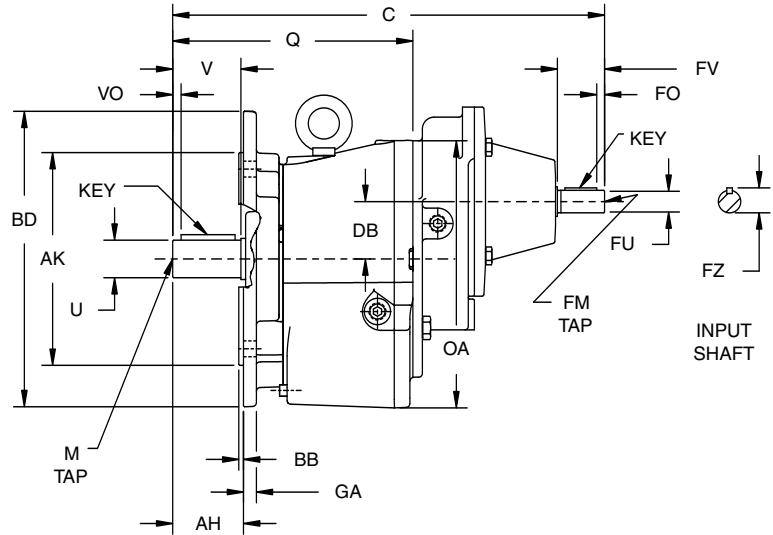
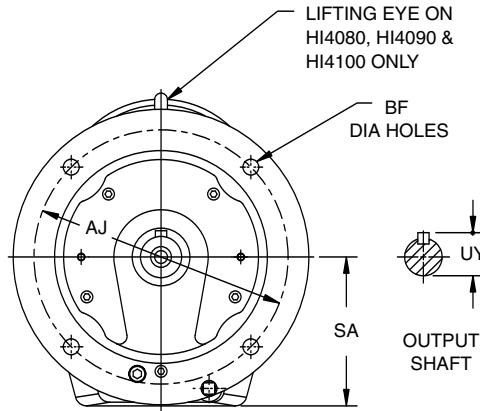


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# Triple Reduction



Dimensions are inch/ mm

Reducer Dimensions

**Gearcase**

Model	OA	Q	SA	DB
HI4043C	7.22	7.29	4.04	1.50
	183	185	103	38
HI4063C	8.92	8.40	4.96	1.91
	227	213	126	49
HI4663C	9.71	9.44	5.75	1.91
	247	240	146	49
HI4073C	10.93	10.79	5.94	1.91
	278	274	151	49
HI4083C	13.05	12.99	7.08	2.36
	331	330	180	60
HI4093C	16.42	16.41	9.45	2.87
	417	417	240	73
HI4103C	17.98	19.00	11.02	3.39
	457	483	280	86

**Output Shaft**

AH	AJ	AK	BB	BD	BF	GA
1.97	6.50	5.118 <sup>+0.002</sup> <sub>-.002</sub>	0.14	7.90	0.47	0.43
50	165	130 <sup>+0.003</sup> <sub>-.004</sub>	4	200	12	11
2.76	8.46	7.087 <sup>-.0004</sup> <sub>-.0029</sub>	0.16	9.84	0.53	0.43
70	215	180 <sup>+0.004</sup> <sub>-.064</sub>	4	250	14	11
2.76	8.46	7.087 <sup>-.0004</sup> <sub>-.0029</sub>	0.16	9.84	0.53	0.43
70	215	180 <sup>+0.004</sup> <sub>-.064</sub>	4	250	14	11
3.15	10.43	9.055 <sup>+0.001</sup> <sub>-.0027</sub>	0.16	11.81	0.53	0.59
80	265	230 <sup>+0.001</sup> <sub>-.072</sub>	4	300	14	15
3.93	11.81	9.843 <sup>-.0005</sup> <sub>-.0025</sub>	0.20	13.78	0.69	0.70
100	300	250 <sup>+0.001</sup> <sub>-.051</sub>	5	350	18	18
4.72	15.75	13.780 <sup>-.0005</sup> <sub>-.0032</sub>	0.19	17.74	0.75	1.02
120	400	350 <sup>+0.001</sup> <sub>-.070</sub>	5	451	19	26
5.51	15.75	13.780 <sup>-.0005</sup> <sub>-.0032</sub>	0.20	17.72	0.75	1.00
140	400	350 <sup>+0.001</sup> <sub>-.070</sub>	5	450	19	25.4

**Output Shaft \* - Cont.**

Model	U	UY	V	VO	KEY	M
HI4043C	1.000 <sup>+0.001</sup> <sub>-.001</sub>	1.10	N/A	0.40	1/4 x 1/4 x 1-1/2	3/8-24 x 0.91
HI4063C	1.375 <sup>+0.001</sup> <sub>-.001</sub>	1.51	N/A	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4663C	1.375 <sup>+0.001</sup> <sub>-.001</sub>	1.51	2.76	0.44	5/16 x 5/16 x 1-3/4	1/2-13 x 1.13
HI4073C	1.625 <sup>+0.001</sup> <sub>-.001</sub>	1.78	3.15	0.45	3/8 x 3/8 x 2-1/4	5/8-11 x 1.38
HI4083C	2.125 <sup>+0.001</sup> <sub>-.001</sub>	2.34	3.94	0.64	1/2 x 1/2 x 2-5/8	3/4-10 x 1.61
HI4093C	2.375 <sup>+0.001</sup> <sub>-.001</sub>	2.64	4.72	0.70	5/8 x 5/8 x 3-3/4	3/4-10 x 1.61
HI4103C	2.875 <sup>+0.001</sup> <sub>-.001</sub>	3.19	5.51	0.67	3/4 x 3/4 x 4-1/8	3/4-10 x 1.61

**Input Shaft \***

Model	FU	FZ	FV	FO	KEY	FM
HI4043C	0.625 <sup>+0.001</sup> <sub>-.001</sub>	0.69	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4063C	0.750 <sup>+0.001</sup> <sub>-.001</sub>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4663C	0.750 <sup>+0.001</sup> <sub>-.001</sub>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4073C	0.750 <sup>+0.001</sup> <sub>-.001</sub>	0.82	1.57	0.25	3/16 x 3/16 x 1-1/16	N/A
HI4083C	0.875 <sup>+0.001</sup> <sub>-.001</sub>	0.95	2.25	N/A	3/16 x 3/16 x 2	1/4-20 x 0.75
HI4093C	1.125 <sup>+0.001</sup> <sub>-.001</sub>	1.23	2.63	N/A	1/4 x 1/4 x 2-3/8	3/8-16 x 1.00
HI4103C	1.375 <sup>+0.001</sup> <sub>-.001</sub>	1.51	3.15	0.35	5/16 x 5/16 x 2-3/8	1/2-13 x 1.41

**Gearcase/Input**

Model	C
HI4043C	12.19
HI4063C	14.78
HI4663C	15.82
HI4073C	16.70
HI4083C	19.66
HI4093C	25.79
HI4103C	31.46

\* See Pages I-22 and I-23 For Additional Shaft Diameters Available.

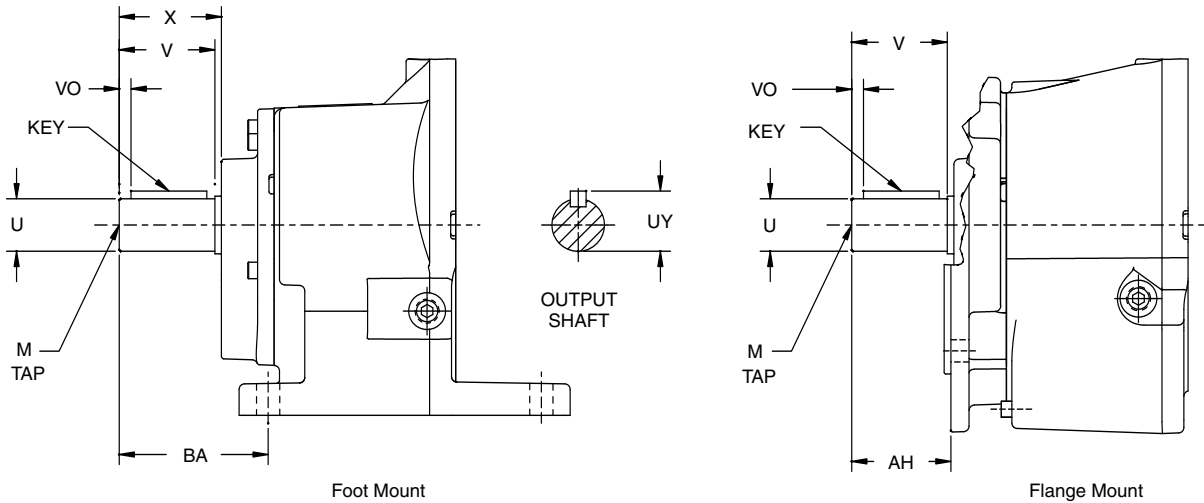
Dimensions subject to change without notice



For safety and to comply with local and national safety codes, the purchaser or user must provide protective guards over all shaft extensions and devices mounted thereon.

# Optional Output Shafts

DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.  
CERTIFIED PRINTS ARE AVAILABLE UPON REQUEST.



**Inch Shafts**

Dimensions are inch

Series	U	UY	V	VO	X	BA	AH	KEY	M
HI4030	-	-	-	-	-	-	-	-	-
HI4040	-	-	-	-	-	-	-	-	-
HI4060	1.250 <sup>+0</sup> <sub>-.001</sub>	1.36	2.36	0.41	2.43	3.54	2.36	1/4 x 1/4 x 1-11/16	3/8-24 x 0.88
HI4660	-	-	-	-	-	-	-	-	-
HI4070	-	-	-	-	-	-	-	-	-
HI4080	-	-	-	-	-	-	-	-	-
HI4090	-	-	-	-	-	-	-	-	-
HI4100	-	-	-	-	-	-	-	-	-

**Metric Shafts**

Dimensions are mm

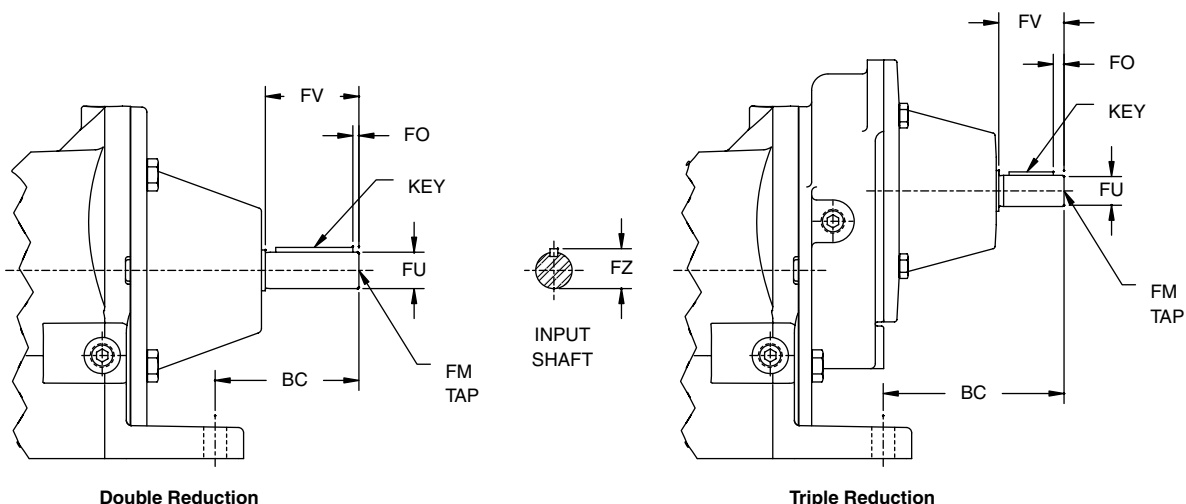
Series	U	UY	V	VO	X	BA	AH	KEY	M
HI4030	20.015	22.5	49	7	50	58	49	6 x 6 x 25	M6x1 x 16
	20.002								
HI4040	24.008	27	52	9	54	75	50	8 x 7 x 28	M8x1.25 x 20
	23.996								
HI4060	25.015	28	52	8	54	75	50	8 x 7 x 28	M10x1.5 x 23
	25.002								
HI4060	28.009	31	60	9	62	90	60	8 x 7 x 40	M10x1.5 x 24
	27.996								
HI4060	30.015	33	60	9	62	90	60	8 x 7 x 40	M10x1.5 x 24
	30.002								
HI4660	35.018	38	N/A	8	72	100	70	10 x 8 x 56	M12x1.75 x 28
	35.002								
HI4070	38.018	41	80	9	83	115	80	10 x 8 x 56	M12x1.75 x 30
	38.002								
HI4070	40.018	43	80	11	83	115	80	12 x 8 x 50	M16x2 x 38
	40.002								
HI4080	48.018	51.5	110	12	113	150	110	14 x 9 x 100	M16x2 x 36
	48.002								
HI4080	50.018	53.5	100	17	103	140	100	14 x 9 x 80	M16x2 x 36
	50.002								
HI4090	60.030	64	120	19	126	160	120	18 x 11 x 60	M20x2.5 x 43
	60.011								
HI4100	70.030	74.5	140	18	143	185	140	20 x 12 x 100	M20x2.5 x 42
	70.011								

Dimensions subject to change without notice



DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.  
CERTIFIED PRINTS ARE AVAILABLE UPON REQUEST.

# Optional Input Shafts



Reducer Dimensions

**Inch Shafts**

Dimensions are inch

	Series	FU	FZ	FV	FO	BC	KEY	FM
Double Reduction	HI4032	-	-	-	-	-	-	-
	HI4042	0.625 <sup>+0</sup> / <sub>-.001</sub>	0.69	1.57	0 - 0.60	3.87	3/16 x 3/16 x 1-1/16	N/A
	HI4062	0.750 <sup>+0</sup> / <sub>-.001</sub>	0.82	1.57	0.25	2.78	3/16 x 3/16 x 1-1/16	N/A
	HI4662	-	-	-	-	-	-	-
	HI4070	0.875 <sup>+0</sup> / <sub>-.001</sub>	0.95	1.97	0.28	4.39	3/16 X 3/16 X 1-1/4	N/A
	HI4082	1.125 <sup>+0</sup> / <sub>-.001</sub>	1.23	2.36	0.32	5.04	1/4 x 1/4 x 1-11/16	3/8-16 x 1.00
	HI4092	-	-	-	-	-	-	-
Triple Reduction	HI4102	-	-	-	-	-	-	-
	HI4043	-	-	-	-	-	-	-
	HI4063	0.625 <sup>+0</sup> / <sub>-.001</sub>	0.69	1.57	0 - 0.60	4.66	3/16 x 3/16 x 1-1/16	N/A
	HI4663	0.625 <sup>+0</sup> / <sub>-.001</sub>	0.69	1.57	0 - 0.60	4.52	3/16 x 3/16 x 1-1/16	N/A
	HI4073	0.625 <sup>+0</sup> / <sub>-.001</sub>	0.69	1.57	0 - 0.60	4.41	3/16 x 3/16 x 1-1/16	N/A
	HI4083	0.750 <sup>+0</sup> / <sub>-.001</sub>	0.82	1.57	0.25	3.24	3/16 x 3/16 x 1-1/16	N/A
	HI4093	0.875 <sup>+0</sup> / <sub>-.001</sub>	0.95	1.97	0.28	6.63	3/16 X 3/16 X 1-1/4	N/A
HI4103	1.125 <sup>+0</sup> / <sub>-.001</sub>	1.23	2.36	0.32	8.83	1/4 x 1/4 x 1-11/16	3/8-16 x 1.00	

**Metric Shafts**

Dimensions are mm

	Series	FU	FZ	FV	FO	BC	KEY	FM
Double Reduction	HI4032	14 <sup>+0.008</sup> / <sub>-.003</sub>	16	30	5	109	5 x 5 x 20	M5x0.8 x 13
	HI4042	16 <sup>+0.008</sup> / <sub>-.003</sub>	18	40	7	90	5 x 5 x 20	N/A
		19 <sup>+0.014</sup> / <sub>-.002</sub>	21.5	40	7	90	6 x 6 x 25	N/A
	HI4062	24 <sup>+0.009</sup> / <sub>-.004</sub>	27	50	9	81	8 x 7 x 30	M8x1.25 x 21
	HI4662	24 <sup>+0.009</sup> / <sub>-.004</sub>	27	50	9	77	8 x 7 x 30	M8x1.25 x 21
	HI4070	28 <sup>+0.009</sup> / <sub>-.004</sub>	31	60	7	121	8 x 7 x 40	M10x1.5 x 24
	HI4082	38 <sup>+0.018</sup> / <sub>-.002</sub>	41	80	5	148	10 x 8 x 70	M12x1.75 x 28
HI4092	48 <sup>+0.018</sup> / <sub>-.002</sub>	51.5	110	5	188	14 x 9 x 100	M16x2 x 38	
HI4102	48 <sup>+0.018</sup> / <sub>-.002</sub>	51.5	110	5	169	14 x 9 x 100	M16x2 x 38	
Triple Reduction	HI4043	14 <sup>+0.008</sup> / <sub>-.003</sub>	16	30	5	95	5 x 5 x 20	M5x0.8 x 13
	HI4063	16 <sup>+0.008</sup> / <sub>-.003</sub>	18	40	7	110	5 x 5 x 20	N/A
		19 <sup>+0.014</sup> / <sub>-.002</sub>	21.5	40	7	110	6 x 6 x 25	N/A
	HI4663	16 <sup>+0.008</sup> / <sub>-.003</sub>	18	40	7	107	5 x 5 x 20	N/A
		19 <sup>+0.014</sup> / <sub>-.002</sub>	21.5	40	7	107	6 x 6 x 25	N/A
	HI4073	16 <sup>+0.008</sup> / <sub>-.003</sub>	18	40	7	104	5 x 5 x 20	N/A
		19 <sup>+0.014</sup> / <sub>-.002</sub>	21.5	40	7	104	6 x 6 x 25	N/A
HI4083	24 <sup>+0.009</sup> / <sub>-.004</sub>	27	50	9	92	8 x 7 x 30	M8x1.25 x 21	
HI4093	28 <sup>+0.009</sup> / <sub>-.004</sub>	31	60	7	178	8 x 7 x 40	M10x1.5 x 24	
HI4103	38 <sup>+0.018</sup> / <sub>-.002</sub>	41	80	5	244	10 x 8 x 70	M12x1.75 x 28	

Dimensions subject to change without notice



For safety and to comply with local and national safety codes, the purchaser or user must provide protective guards over all shaft extensions and devices mounted thereon.

# Shipping Weights & Motor Compatibility

## \*\*Reducer Weights - Foot Mounted (lbs.)

Unit Size	Solid Input Shaft	C-Frame Quill Input							
		56C	143TC	182TC	213TC	254TC	284TC	324TC	364TC
HI4032	17	18	-	-	-	-	-	-	-
HI4042	27	28	28	33	-	-	-	-	-
HI4043	33	34	-	-	-	-	-	-	-
HI4062	46	46	46	61	61	-	-	-	-
HI4063	59	59	59	-	-	-	-	-	-
HI4064	59	61	61	66	-	-	-	-	-
HI4662	70	70	70	85	85	-	-	-	-
HI4663	85	85	85	-	-	-	-	-	-
HI4664	87	88	88	-	-	-	-	-	-
HI4072	92	88	88	103	103	103	-	-	-
HI4073	111	107	107	-	-	-	-	-	-
HI4074	118	118	118	124	-	-	-	-	-
HI4082	142	-	-	166	166	166	174	-	-
HI4083	169	148	148	168	-	-	-	-	-
HI4084	218	-	218	234	234	-	-	-	-
HI4092	241	-	-	265	265	265	280	-	-
HI4093	281	283	283	325	335	335	350	-	-
HI4094	292	-	-	347	347	-	-	-	-
HI4102	380	-	-	380	380	425	425	455	470
HI4103	410	-	-	410	410	455	455	-	-
HI4104	445	-	-	445	445	480	-	-	-

## \*\*Reducer Weights - Flange Mounted (lbs.)

Unit Size	Solid Input Shaft	C-Frame Quill Input							
		56C	143TC	182TC	213TC	254TC	284TC	324TC	364TC
HI4032	19	20	-	-	-	-	-	-	-
HI4042	29	30	30	35	-	-	-	-	-
HI4043	35	36	-	-	-	-	-	-	-
HI4062	51	51	51	66	66	-	-	-	-
HI4063	64	64	64	-	-	-	-	-	-
HI4064	64	66	66	71	-	-	-	-	-
HI4662	80	80	80	95	95	-	-	-	-
HI4663	95	95	95	-	-	-	-	-	-
HI4664	97	98	98	-	-	-	-	-	-
HI4072	105	101	101	116	116	116	-	-	-
HI4073	124	120	120	-	-	-	-	-	-
HI4074	131	131	131	137	-	-	-	-	-
HI4082	167	-	-	191	191	191	199	-	-
HI4083	194	173	173	193	-	-	-	-	-
HI4084	243	-	243	259	259	-	-	-	-
HI4092	281	-	-	305	305	305	320	-	-
HI4093	316	318	318	360	370	370	385	-	-
HI4094	327	-	-	382	382	-	-	-	-
HI4102	398	-	-	398	398	443	443	473	488
HI4103	428	-	-	428	428	473	473	-	-
HI4104	463	-	-	463	463	498	-	-	-

\*\*For Integral gearmotor weights, follow instructions above (with similar hp C-face motor), and multiply by .93.

# TERMS AND CONDITIONS OF SALES QUOTATIONS ARE MADE AND ORDERS ARE ACCEPTED BY SELLER SUBJECT ONLY TO THESE TERMS AND CONDITIONS:

1. **AGREEMENT AND MODIFICATION OF SALES TERMS.** The agreement between Seller and Buyer ("Sales Contract") is with respect to the sale of goods described on the other side hereof (the "goods"). Any Terms and Conditions contained in any purchase order or other form of communication from Seller's customers which are additional to or different from these Terms and Conditions shall be deemed rejected by Seller unless expressly accepted in writing by Seller.
2. **ACCEPTANCE OF ORDERS.** Acceptance by Seller of Buyer's purchase order(s) is expressly conditioned upon Buyer's assent to these Terms and Conditions. Buyer will be deemed to have assented to such Terms and Conditions unless Seller receives written notice of any objections within 10 days after Buyer's receipt of this form or in all events prior to any delivery or other performance by Seller of Buyer's order if less than 10 days.
3. **QUOTATIONS.** Quotations by Seller shall be deemed to be offers by Seller to sell the goods described therein subject to these Terms and Conditions, and acceptance of such offers is expressly limited to acceptance by Buyer of all of these Terms and Conditions within 30 days from the date of the quotation or as specified. Purchase orders submitted by Buyer for the goods quoted by Seller shall be subject to and will be deemed to constitute acceptance of these Terms and Conditions. All purchase orders will be subject to approval by Seller.
4. **TERMINATION OR MODIFICATION.** The Sales Contract may be modified or terminated only upon Seller's express written consent, which consent will at all times be conditioned on Buyer's agreement to pay Seller's modification or termination charge including, but not limited to expenses and costs plus a reasonable profit, except that any goods completed on or before Seller's acceptance of termination shall be accepted and paid in full by Buyer.
5. **PRICES AND TERMS.** Fulfillment of Buyer's order is contingent upon the availability of materials. The price of the goods sold pursuant to the Sales Contract shall be based upon Seller's prices in effect at the time of shipment and any acceptance of the order will be on the basis of the freight rates now in effect. In the event of an increase or decrease in the applicable freight charges before the material is shipped, such changes in freight charges will be for the account of Buyer. Price advances, discounts, extras and terms and conditions are subject to changes without notice. Unless otherwise provided on the front side hereof, price is F.O.B. Seller's point of shipment, and terms of payment shall be net 30 days from date of invoice. Seller may assess a delinquency charge of 1-1/2 percent per month on invoices not paid within stated payment terms. Seller may require full or partial payment or payment guarantees in advance of shipment whenever, in its opinion, the financial condition of Buyer so warrants. In addition, Seller may, at any time, suspend performance of any order or require payment in cash, security or other adequate assurance satisfactory to Seller when, in Seller's opinion, the financial condition of Buyer warrants such action.
6. **TAXES.** Prices do not include sales, use or other similar federal, state or local taxes. Buyer shall pay to Seller, in addition to the price of the goods, all applicable taxes which may be invoiced separately at a later date.
7. **DESIGN; EXTRA WORK; BUYER'S MATERIAL.** (a) If any order accepted by Seller contemplates the preparation of special designs by Seller, Buyer issuing such order will have a responsible representative specifically approve all designs prepared by Seller.  
(b) If Buyer requests extra work not included in the quotation or original order, Buyer will pay for the extra work at reasonable rates as determined by Seller.  
(c) In the event spoilage/damage occurs on orders where Buyer furnishes the material, Seller shall not be liable for replacement of or damage to such material.
8. **RISK OF LOSS, TITLE, SECURITY INTEREST.** Delivery shall occur, and risk of loss shall pass to Buyer, upon delivery of the material to a carrier at the F.O.B. point of shipment. Transportation shall be at Buyer's sole risk and expense, and any claims for losses or damage in transit shall be against the carrier only. However, Seller retains title to all products until paid for in full in cash and Buyer agrees to perform all acts necessary to provide a fully perfected security interest in the goods in favor of Seller. Seller may, at Seller's option, repossess the same, upon Buyer's default in payment hereunder, and charge Buyer with any deficiency.
9. **DELIVERIES AND QUANTITIES.** (a) Delivery dates are not guaranteed but are estimated on the basis of immediate receipt by Seller of all information to be furnished by Buyer and the absence of delay, direct or indirect, resulting from or contributed to by circumstances beyond Seller's reasonable control. If the goods are non-catalog goods, Seller may ship overages or underages to the extent of 10 percent of quantity ordered, and Buyer shall pay for such quantity based upon the unit price of the goods. Seller shall not be required to maintain closer control of quantity, unless specifically agreed to by Seller in writing. Quantities of all items may be determined by weight. Any claims for shortage must be within 10 days from the date of receipt of the goods by Buyer, and in every case the weights found in any particular shipment, including tare, must be given and Seller advised as to the method used by Buyer in computing the count of parts.  
(b) In the event that Buyer is unable to accept delivery of the goods at time of shipment, Seller shall invoice Buyer for the full purchase price as if shipment had been made and: (i) if Seller is able to store such goods in its own facilities, Buyer will pay Seller the reasonable handling and storage charges for the period of such storage, and (ii) if Seller is unable to store such goods at its own facility, Seller reserves the right to arrange handling and storage in a suitable bonded warehouse for the Buyer at Buyer's expense. In cases where handling and storage become necessary, it shall be Buyer's responsibility to notify Seller when shipment is to be made. Seller will make necessary arrangements for shipment at Buyer's expense.
10. **RETURNED GOODS.** Goods may not be returned. However, if Seller consents in writing or upon verbal authorization to the return of goods for any reason, transportation charges must be prepaid by Buyer, who also shall assume all risk of loss of such returned goods until actual receipt by Seller.
11. **INSPECTION, ACCEPTANCE.** Buyer shall inspect the goods immediately upon the receipt thereof. All claims by Buyer (including claims for shortages), except only those provided for under the WARRANTY AND LIMITATIONS OF LIABILITY and PATENTS clauses below, must be asserted in writing by Buyer within a 10 day period or they are waived. If this contract involves partial performances, all such claims must be asserted within a 10 day period for each partial performance. Rejection may be only for defects substantially impairing the value of products or work. Buyer's remedy for lesser defects shall be those provided for under the Warranty and Liability clauses. THERE SHALL BE NO REVOCATION OF ACCEPTANCE. If Buyer wrongfully rejects, revokes or delays acceptance of items or work tendered under this contract, or fails to make a payment due on or before delivery, or repudiates this contract, Seller shall, at its option, have a right to recover as damages, either the price as stated herein (upon recovery of the price, the items involved shall become the property of the Buyer) or the profit (including reasonable overhead) which the Seller would make from performance together with incidental damages and reasonable cost.
12. **WARRANTIES AND LIMITATIONS OF LIABILITY.** (a) Seller warrants to Buyer that the goods will conform to the following warranty: The goods will be commercially free from defects in material and workmanship under normal use for a period of 1 year from the date of shipment of the goods by Seller and will conform at the date of shipment to applicable specifications, drawings and blueprints, except for departures therefrom with written approval of Buyer; provided that work performed by Seller upon blanks and other materials furnished by Buyer is excluded from this warranty. Seller shall have no liability to Buyer for cost of blanks furnished by Buyer which are damaged or spoiled during heat treat or machining operations;  
(b) In the case of drives, gears and reducers manufactured by Seller, Seller warrants only that such products, when shipped, shall be capable of delivering the service rating as indicated in Seller's written documents, including quotations and catalogs or as noted on such products, providing such equipment is properly installed and maintained, correctly lubricated, operating under normal conditions with competent supervision, and within the load limits for which it was sold, and provided further that the equipment is free from critical speed, torsional or other type vibration, no matter how induced;  
(c) If any model or sample was provided to the Buyer, it was used merely to illustrate the general type and quality of goods and not to warrant that goods shipped would be of that type or quality;  
(d) UNLESS AUTHORIZED IN WRITING BY A CORPORATE OFFICER OR VICE PRESIDENT, NO AGENT, EMPLOYEE OR REPRESENTATIVE OF SELLER HAS ANY AUTHORITY TO BIND SELLER TO ANY AFFIRMATION, REPRESENTATION OR WARRANTY CONCERNING THE GOODS SOLD UNDER THE SALES CONTRACT AND ANY SUCH AFFIRMATION, REPRESENTATION OR WARRANTY HAS NOT FORMED A PART OF THE BASIS OF THE BARGAIN AND SHALL BE UNENFORCEABLE;  
(e) Seller's sole obligation under the foregoing warranties is limited to either, at Seller's option, replacing or repairing defective goods (or defective parts thereof). This warranty does not cover the cost of installation of the new or repaired goods or parts. Replacement goods or parts are warranted for the remainder of the warranty

period applicable to the goods originally supplied by Seller. All claims for allegedly defective goods must be made within 10 days after Buyer learns of such alleged defects. All claims not made in writing and received by Seller within such 10 day period shall be deemed waived. Buyer shall return a sample of the alleged defective part for Seller's inspection, and no other goods shall be returned to Seller without Seller's written consent. This warranty shall not extend to goods subjected to misuse, abuse, neglect, accident or improper installation or maintenance, incorrect lubrication, or goods which have been altered or repaired by anyone other than Seller or its authorized representative;

(f) THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND/OR ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED;

(g) Products not manufactured and work not performed by Seller are warranted only to the extent and in the manner that the same are warranted to Seller by Seller's vendors, and then only to the extent that Seller is reasonably able to enforce such warranty. In enforcing such warranty, it is understood Seller shall have no obligation to initiate litigation unless Buyer undertakes to pay all costs and expenses therefor, including but not limited to Attorney's fees, and indemnifies Seller against any liability to Seller's vendors arising out of such litigation;

(h) THE FOREGOING IS SELLER'S ONLY OBLIGATION AND BUYER'S EXCLUSIVE REMEDY FOR BREACH OF WARRANTY. BUYER'S FAILURE TO SUBMIT A CLAIM AS PROVIDED ABOVE SHALL SPECIFICALLY WAIVE ALL CLAIMS FOR DAMAGES OR OTHER RELIEF INCLUDING BUT NOT LIMITED TO CLAIMS BASED ON LATENT DEFECTS. IN NO EVENT SHALL BUYER BE ENTITLED TO INCIDENTAL, CONSEQUENTIAL, CONTINGENT, OR SPECIAL DAMAGES, NOR SHALL SELLER'S LIABILITY EXCEED THE PURCHASE PRICE OF THE GOODS. EVEN IF THE REPAIR OR REPLACEMENT REMEDY SHALL BE DEEMED TO HAVE FAILED OF ITS ESSENTIAL PURPOSE UNDER SECTION 2-719 OF THE UNIFORM COMMERCIAL CODE, SELLER SHALL HAVE NO LIABILITY TO BUYER FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES, SUCH AS LOST PROFITS, LOST REVENUE, DAMAGE TO OTHER EQUIPMENT OR LIABILITY OR INJURY TO A THIRD PARTY. ANY ACTION ARISING HEREUNDER OR RELATED HERETO MUST BE COMMENCED WITHIN ONE (1) YEAR AFTER THE CAUSE OF ACTION OCCURS OR IT SHALL BE BARRED, NOTWITHSTANDING ANY STATUTORY PERIOD OF LIMITATIONS TO THE CONTRARY; and

(i) In the event of the resale of any of the goods, in whatever form, Buyer will include the following language in a conspicuous place and in a conspicuous manner in a written agreement covering such resale: "THE MANUFACTURER MAKES NO WARRANTIES OR REPRESENTATIONS, EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OF THE GOODS SOLD HEREUNDER. BUYER ACKNOWLEDGES THAT IT ALONE HAS DETERMINED THAT THE GOODS PURCHASED HEREUNDER WILL SUITABLY MEET THE REQUIREMENTS OF THEIR INTENDED USE. IN NO EVENT WILL MANUFACTURER BE LIABLE FOR CONSEQUENTIAL, INCIDENTAL OR OTHER DAMAGES."

13. **REMEDIES AND LIMITATIONS OF LIABILITY.** In the event Buyer claims Seller has breached any of its obligations under the Sales Contract, whether of warranty or otherwise, Seller may request the return of goods and tender to Buyer, at Seller's option, a replacement shipment of goods. If Seller so requests the return of the goods, the goods will be redelivered to Seller in accordance with Seller's instructions and at Buyer's expense. Except as herein provided, Seller shall have no further obligation under the Sales Contract. The remedies contained in this paragraph and paragraph 12 hereof shall constitute the sole recourse of Buyer against Seller for breach of any of Seller's obligations under the Sales Contract, whether warranty or otherwise.

14. **TECHNICAL ADVICE.** Any technical advice furnished or recommendation made by Seller or any representative of Seller concerning any use or application of any of the goods is believed to be reliable, but SELLER MAKES NO WARRANTY, EXPRESSED OR IMPLIED, ON RESULTS TO BE OBTAINED. BUYER ASSUMES ALL RESPONSIBILITY FOR LOSS OR DAMAGE RESULTING FROM THE HANDLING OR USE OF ANY OF THE GOODS.

15. **FORCE MAJEURE.** Seller shall not be liable for failure to perform its obligations under the Sales Contract in whole or in part caused by the occurrence of any contingencies beyond the reasonable control either of Seller or of suppliers of Seller. If any such contingency occurs, Seller may allocate goods and deliveries among Seller's customers.

16. **ASSIGNMENT AND DELEGATION.** No right or interest in the Sales Contract shall be assigned by Buyer without Seller's prior written consent, and no delegation of any obligation owed, or to the performance of any obligation by Buyer shall be made without Seller's prior written consent. Any attempt at assignment or delegation shall be wholly void and totally ineffective for all purposes unless made in conformity with this paragraph.

17. **PATTERNS AND TOOLING.** Unless otherwise agreed to in writing with Buyer, Seller shall retain title to and possession of all special tooling, patterns and dies whether paid for by Buyer or not, but such special tooling, patterns and dies that are specifically paid for by Buyer will be held by Seller exclusively for the manufacture of Buyer's goods for not more than 2 years after the date of Buyer's last order requiring their use. Seller will exercise reasonable care in handling and storing any tooling, patterns or dies specifically paid for by Buyer, but Seller shall not be liable for damage or loss thereof.

18. **PATENTS. SELLER MAKES NO REPRESENTATION OR WARRANTY WITH RESPECT TO THE PATENTABILITY OF THE GOODS OR THAT ANY OF THE GOODS WILL BE FREE FROM CLAIMS OF INFRINGEMENT.** Buyer agrees to indemnify and defend Seller in any such suit, action or proceeding for any claim resulting from actual or alleged infringement of any domestic or foreign letters patent for (i) any feature, construction or design incorporated at Buyer's request in any goods or to adapt such goods to the particular use of Buyer or Buyer's customers or (ii) any additions, changes or adaptations made by Buyer or Buyer's customers after delivery of the goods.

19. **CONFIDENTIAL INFORMATION.** All drawings, diagrams, specifications, technical data and other materials furnished by Seller and identified by Seller as confidential are and shall remain the exclusive property of Seller and shall be returned to Seller upon request. Buyer agrees to treat such information and material as confidential and not to reproduce or disclose such information or materials without Seller's prior written consent. This paragraph does not apply to any information already known to and readily accessible in the trade or which may become so through no fault of Buyer.

20. **CHANGES.** Seller may, at any time, without notice, make changes (whether in design, material, improvements or otherwise) in any catalog goods, and may discontinue the manufacture of any catalog goods, all in its sole discretion, without incurring any obligations of any kind as a result thereof, whether for failure to fill an order of Buyer or otherwise.

21. **INSTALLATION.** Installation of the goods shall be by Buyer unless otherwise specifically stated in the Sales Contract.

22. **SEVERABILITY.** If any term or provision contained in the Sales Contract is declared or held invalid by a court of competent jurisdiction, such declaration or holding shall not affect the validity of any other term, clause or provision contained herein.

23. **GOVERNING LAW AND LIMITATION.** (a) The formation and performance of the Sales Contract shall be deemed to have been made and governed by the Uniform Commercial Code as adopted in the state of Seller's principal place of business;

(b) Buyer hereby agrees to the jurisdiction of any state or federal court located in the county of Seller's principal place of business. Buyer waives any objection based on forum non conveniens and any objection to venue of any action instituted hereunder, and consents to the granting of such legal or equitable relief as is deemed appropriate by a court of competent jurisdiction. The rights and obligations of Seller and Buyer shall not be governed by the provisions of the United Nations Convention on Contracts for the International Sale of Goods; and

(c) Seller represents that the goods will be produced in compliance with the Fair Labor Standards Act of 1938, as amended.

(d) BUYER AGREES TO PAY ALL OF SELLER'S COSTS AND EXPENSES OF COLLECTION AND LITIGATION, INCLUDING BUT NOT LIMITED TO ATTORNEYS' FEES AND COSTS.