

# GROVE GEAR

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# A.G.M.A. Service Factors

Application	Load Duration			Application	Load Duration		
	Up to 3 hrs. per day	3 to 10 hrs. per day	Over 10 hrs. per day		Up to 3 hrs. per day	3 to 10 hrs. per day	Over 10 hrs. per day
Metal strip processing machinery (continued)				Secondary processing			
Loopers (accumulators)	1.00	1.00	1.25	Blow molders	1.50	1.50	1.50
Pinch rolls	1.25	1.25	1.50	Coating	1.25	1.25	1.25
Scrap choppers	1.25	1.25	1.50	Film	1.25	1.25	1.25
Shears	2.00	2.00	2.00	Pipe	1.25	1.25	1.25
Slitters	1.00	1.25	1.50	Pre-plasticizers	1.50	1.50	1.50
Mills, rotary type				Rods	1.25	1.25	1.25
Ball & rod				Sheet	1.25	1.25	1.25
Spur ring gear	2.00	2.00	2.00	Tubing	1.25	1.25	1.50
Helical ring gear	1.50	1.50	1.50	Pullers - barge haul	1.25	1.25	1.50
Direct connected	2.00	2.00	2.00	Pumps			
Cement kilns	1.50	1.50	1.50	Centrifugal	1.00	1.00	1.25
Dryers & coolers	1.50	1.50	1.50	Proportioning	1.25	1.25	1.50
Mixers				Reciprocating			
Concrete	1.25	1.25	1.50	Single acting, 3 or more cylinders	1.25	1.25	1.50
Paper mills 2)				Double acting, 2 or more cylinders	1.25	1.25	1.50
Agitator (mixer)	1.50	1.50	1.50	Rotary			
Agitator for pure liquors	1.25	1.25	1.25	Gear type	1.00	1.00	1.25
Barking drums	2.00	2.00	2.00	Lobe	1.00	1.00	1.25
Barkers - mechanical	2.00	2.00	2.00	Vane	1.00	1.00	1.25
Beater	1.50	1.50	1.50	Rubber industry			
Breaker stack	1.25	1.25	1.25	Intensive internal mixers			
Calender 3)	1.25	1.25	1.25	Batch mixers	1.75	1.75	1.75
Chipper	2.00	2.00	2.00	Continuous mixers	1.50	1.50	1.50
Chip feeder	1.50	1.50	1.50	Mixing mill - 2 smooth rolls (if corrugated			
Coating rolls	1.25	1.25	1.25	rolls are used, then use the same service			
Conveyors				factors that are used for a cracker warmer)	1.50	1.50	1.50
Chip, bark, chemical	1.25	1.25	1.25	Batch drop mill - 2 smooth rolls	1.50	1.50	1.50
Log (including slab)	2.00	2.00	2.00	Cracker warmer - 2 rolls; 1 corrugated roll	1.75	1.75	1.75
Couch rolls	1.25	1.25	1.25	Cracker - 2 corrugated rolls	2.00	2.00	2.00
Cutter	2.00	2.00	2.00	Holding, feed & blend mill - 2 rolls	1.25	1.25	1.25
Cylinder molds	1.25	1.25	1.25	Refiner - 2 rolls	1.50	1.50	1.50
Dryers 3)				Calenders	1.50	1.50	1.50
Paper machine	1.25	1.25	1.25	Sand muller	1.25	1.25	1.50
Conveyor type	1.25	1.25	1.25	Sewage disposal equipment			
Embosser	1.25	1.25	1.25	Bar screens	1.25	1.25	1.25
Extruder	1.50	1.50	1.50	Chemical feeders	1.25	1.25	1.25
Fourdrinier rolls (includes lump breaker,				Dewatering screens	1.50	1.50	1.50
dandy roll, wire turning, and return rolls)	1.25	1.25	1.25	Scum breakers	1.50	1.50	1.50
Jordan	1.50	1.50	1.50	Slow or rapid mixers	1.50	1.50	1.50
Kiln drive	1.50	1.50	1.50	Sludge collectors	1.25	1.25	1.25
Mt. Hope roll	1.25	1.25	1.25	Thickeners	1.50	1.50	1.50
Paper rolls	1.25	1.25	1.25	Vacuum filters	1.50	1.50	1.50
Platter	1.50	1.50	1.50	Screens			
Presses - felt & suction	1.25	1.25	1.25	Air washing	1.00	1.00	1.25
Pulper	2.00	2.00	2.00	Rotary - stone or gravel	1.25	1.25	1.50
Pumps - vacuum	1.50	1.50	1.50	Traveling water intake	1.00	1.00	1.25
Reel (surface type)	1.25	1.25	1.25	Sugar industry			
Screens				Beet slicer	2.00	2.00	2.00
Chip	1.50	1.50	1.50	Cane knives	1.50	1.50	1.50
Rotary	1.50	1.50	1.50	Crushers	1.50	1.50	1.50
Vibrating	2.00	2.00	2.00	Mills (low speed end)	1.75	1.75	1.75
Size press	1.25	1.25	1.25	Textile industry			
Super calender 4)	1.25	1.25	1.25	Batchers	1.25	1.25	1.50
Thickener (AC motor)	1.50	1.50	1.50	Calenders	1.25	1.25	1.50
(DC motor)	1.25	1.25	1.25	Cards	1.25	1.25	1.50
Washer (AC motor)	1.50	1.50	1.50	Dry cans	1.25	1.25	1.50
(DC motor)	1.25	1.25	1.25	Dryers	1.25	1.25	1.50
Wind and unwind stand	1.00	1.00	1.00	Dyeing machinery	1.25	1.25	1.50
Winders (surface type)	1.25	1.25	1.25	Looms	1.25	1.25	1.50
Yankee dryers 3)	1.25	1.25	1.25	Mangles	1.25	1.25	1.50
Plastics industry				Nappers	1.25	1.25	1.50
Primary processing				Pads	1.25	1.25	1.50
Intensive internal mixers				Slashers	1.25	1.25	1.50
Batch mixers	1.75	1.75	1.75	Soapers	1.25	1.25	1.50
Continuous mixers	1.50	1.50	1.50	Spinners	1.25	1.25	1.50
Batch drop mill - 2 smooth rolls	1.25	1.25	1.25	Tenter frames	1.25	1.25	1.50
Continuous feed, holding & blend mill	1.25	1.25	1.25	Washers	1.25	1.25	1.50
Compounding mill	1.25	1.25	1.25	Winders	1.25	1.25	1.50
Calenders	1.50	1.50	1.50				

**NOTES:**

- 1) Crane drives are to be selected based on gear tooth bending strength. Contact gear manufacturer for strength ratings. Service factor in durability should a minimum of 1.0.
- 2) Service factors for paper mill applications are applied to the nameplate rating of the electric drive motor at the motor rated based speed.
- 3) Anti-friction bearings only. Use 1.5 for sleeve bearings.
- 4) A service factor of 1.00 may be applied at base speed of a super calender operating over-speed range of part range constant horsepower, part range constant torque where the constant horsepower speed range is greater than 1.5 to 1. A service factor of 1.25 is applicable to super calenders operating over the entire speed range at constant torque or where the constant horsepower speed range is less than 1.5 to 1.

# A.G.M.A. Service Factors

Application	Load Duration			Application	Load Duration		
	Up to 3 hrs. per day	3 to 10 hrs. per day	Over 10 hrs. per day		Up to 3 hrs. per day	3 to 10 hrs. per day	Over 10 hrs. per day
Agitators (mixers)				Fans			
Pure liquids	1.00	1.00	1.25	Centrifugal	1.00	1.00	1.25
Liquids and solids	1.00	1.25	1.50	Cooling towers	2.00	2.00	2.00
Liquids - variable density	1.00	1.25	1.50	Forced draft	1.25	1.25	1.25
Blowers				Induced draft	1.50	1.50	1.50
Centrifugal	1.00	1.00	1.25	Industrial & mine	1.50	1.50	1.50
Lobe	1.00	1.25	1.50	Feeders			
Vane	1.00	1.25	1.50	Apron	1.00	1.25	1.50
Brewing and distilling				Belt	1.00	1.25	1.50
Bottling machinery	1.00	1.00	1.25	Disc	1.00	1.00	1.25
Brew kettles - continuous duty	1.25	1.25	1.25	Reciprocating	1.50	1.75	2.00
Cookers - continuous duty	1.25	1.25	1.25	Screw	1.00	1.25	1.50
Mash tubs - continuous duty	1.25	1.25	1.25	Food industry			
Scale hopper - frequent starts	1.25	1.25	1.50	Cereal cooker	1.00	1.00	1.25
Can filling machines	1.00	1.00	1.25	Dough mixer	1.25	1.25	1.50
Car dumpers	1.50	1.75	2.00	Meat grinders	1.25	1.25	1.50
Car pullers	1.00	1.25	1.50	Slicers	1.25	1.25	1.50
Clarifiers	1.00	1.00	1.25	Generators and exciters	1.00	1.00	1.25
Classifiers	1.00	1.25	1.50	Hammer mills	1.75	1.75	2.00
Clay working machinery				Hoists			
Brick press	1.50	1.75	2.00	Heavy duty	1.75	1.75	2.00
Briquette machine	1.50	1.75	2.00	Medium duty	1.25	1.25	1.50
Pug mill	1.00	1.25	1.50	Skip hoist	1.25	1.25	1.50
Compactors	2.00	2.00	2.00	Laundry			
Compressors				Tumblers	1.25	1.25	1.50
Centrifugal	1.00	1.00	1.25	Washers	1.50	1.50	2.00
Lobe	1.00	1.25	1.50	Lumber industry			
Reciprocating, multi-cylinder	1.50	1.50	1.75	Barkers - spindle feed	1.25	1.25	1.50
Reciprocating, single - cylinder	1.75	1.75	2.00	Main drive	1.75	1.75	1.75
Cranes 1)				Conveyors - burner	1.25	1.25	1.50
Dry dock				Main or heavy duty	1.50	1.50	1.50
Main hoist	2.50	2.50	2.50	Main log	1.75	1.75	2.00
Auxiliary hoist	2.50	2.50	3.00	Re-saw, merry-go-round	1.25	1.25	1.50
Boom hoist	2.50	2.50	3.00	Conveyors			
Slewing drive	2.50	2.50	3.00	Slab	1.75	1.75	2.00
Traction drive	3.00	3.00	3.00	Transfer	1.25	1.25	1.50
Container				Chains			
Main hoist	3.00	3.00	3.00	Floor	1.50	1.50	1.50
Boom hoist	2.00	2.00	2.00	Green	1.50	1.50	1.75
Trolley drive				Cut-off saws			
Gantry drive	3.00	3.00	3.00	Chain	1.50	1.50	1.75
Traction drive	2.00	2.00	2.00	Drag	1.50	1.50	1.75
Mill duty				Debarking drums	1.75	1.75	2.00
Main hoist	3.50	3.50	3.50	Feeds			
Auxiliary	3.50	3.50	3.50	Edger	1.25	1.25	1.50
Bridge	2.50	3.00	3.00	Gang	1.75	1.75	1.75
Trolley travel	2.50	3.00	3.00	Trimmer	1.25	1.25	1.50
Industrial duty				Log deck	1.75	1.75	1.75
Main	2.50	2.50	3.00	Log hauls - incline - well type	1.75	1.75	1.75
Auxiliary	2.50	2.50	3.00	Log turning devices	1.75	1.75	1.75
Bridge	2.50	3.00	3.00	Planer feed	1.25	1.25	1.50
Trolley travel	2.50	3.00	3.00	Planer tilting hoists	1.50	1.50	1.50
Crusher				Rolls - live-off bearing - roll cases	1.75	1.75	1.75
Stone or ore	1.75	1.75	2.00	Sorting table	1.25	1.25	1.50
Dredges				Tipple hoist	1.25	1.25	1.50
Cable reels	1.25	1.25	1.50	Transfers			
Conveyors	1.25	1.25	1.50	Chain	1.50	1.50	1.75
Cutter head drives	2.00	2.00	2.00	Craneway	1.50	1.50	1.75
Pumps	2.00	2.00	2.00	Tray drives	1.25	1.25	1.50
Screen drives	1.75	1.75	2.00	Veneer lathe drives	1.25	1.25	1.50
Stackers	1.25	1.25	1.50	Metal mills			
Winches	1.25	1.25	1.50	Draw bench carriage and main drive	1.25	1.25	1.50
Elevators				Runout table			
Bucket	1.00	1.25	1.50	Non-reversing			
Centrifugal discharge	1.00	1.00	1.25	Group drives	1.50	1.50	1.50
Escalators	1.00	1.00	1.25	Individual drives	2.00	2.00	2.00
Freight	1.00	1.25	1.50	Reversing	2.00	2.00	2.00
Gravity discharge	1.00	1.00	1.25	Slab pushers	1.50	1.50	1.50
Extruders				Shears	2.00	2.00	2.00
General	1.50	1.50	1.50	Wire drawing	1.25	1.25	1.50
Plastics				Wire winding machine	1.25	1.50	1.50
Variable speed drive	1.50	1.50	1.50	Metal strip processing machinery			
Fixed speed drive	1.75	1.75	1.75	Bridles	1.25	1.25	1.50
Rubber				Coilers & uncoilers	1.00	1.00	1.25
Continuous screw operation	1.75	1.75	1.75	Edge trimmers	1.00	1.25	1.50
Intermittent screw operation	1.75	1.75	1.75	Flatteners	1.25	1.25	1.50



# Engineering Data - Helical Concentric Lubrication

Lubrication Recommendations for continuous operation in ambient temperatures of 30° to 125°F (0° to 50°C) and operating temperatures to 185°F (85°C)

Castrol Limited	Chevron Corporation	Citgo Petroleum Corporation	Mobil Corporation	Shell Group of Companies	Texaco, Inc.
Standard Alpha SP 220	Gear Compound EP ISO 220	EP Compound #220	Mobilgear 630	Omala 220	Meropa 220
Note: Grove Gear TorqueLine Reducers are factory filled with lubricant					
For ambient temperatures below 30°F (0°C), above 125° (50°C) or intermittent duty contact factory for lubricant recommendation					

## TorqueLine™ Helical In-Line

### Approximate Oil Capacities (Pints) Helical In-Line Double and Triple Reduction

Model Type	Mounting Position	Unit Size (Foot or Flange Mount)														
		7172	8272	8273	8472	8473										
		7173	8372	8373	8572	8573	8672	8673	8772	8773	8872	8873	8972	8973	81072	81073
C-Frame or Gearmotor Models	B3, B5 Floor	Permanently	1	2	1.6	4.1	3.3	6.1	4.3	8.1	6.8	11.6	16.9	29.6	22.5	39.4
		Grease Lubed	1.8	2	3	4.2	5.2	5.9	7.4	7.6	11.4	11.8	20.1	20.3	28.4	29.0
	B8 Ceiling	Permanently	1.5	1.7	2.3	3	4.2	4.3	6.1	5.5	10.1	10.1	19.6	19.6	25.5	25.5
		Grease Lubed	1.4	2.8	2.5	4.7	4.0	7.1	5.5	9.5	10	15.8	13.6	21.7	19.4	30.0
Shaft Input Models	B3, B5 Floor	Permanently	1	2	1.6	4.1	3.3	6.1	4.3	8.1	6.8	11.6	16.9	29.6	22.5	39.4
		Grease Lubed	2.2	2.2	3.1	4.3	5.4	6.4	7.8	8.6	13.2	12.9	23.3	22.3	33.3	31.0
	B8 Ceiling	Permanently	1.6	1.9	2.4	3.1	4.2	5.1	6.1	7.1	11	10.8	21.6	20.6	30.0	26.5
		Grease Lubed	1.4	2.8	2.5	4.7	4.0	7.1	5.5	9.5	10	15.8	13.6	21.7	19.4	30.0

### Approximate Oil Capacities (Pints) Helical In-Line Quad Reduction

Quad reduction units are compound units, and the primary and secondary units are filled separately. Refer to the model table below and use the oil capacities in the table above.

Unit Size	8474	8574	8674	8774	8874	8974	81074	
Primary Unit Size	8372	8372	8572	8772	8872	8872	8872	(use primary oil capacities for desired Input type)
Secondary Unit Size	8472	8672	8772	8872	8972	81072	81072	(use secondary oil capacities for C-Frame Input)
	8572							

# TorqueLine™ Helical In-Line

## HELICAL IN-LINE MOUNTING POSITION, FILL, LEVEL AND DRAIN LOCATIONS

FOOT MOUNT DOUBLE REDUCTION		FOOT MOUNT TRIPLE REDUCTION	
GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT	GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT
<p>8472-8772 8872-81072</p> <p>B3 - Standard Floor</p>	<p>8472-8772 8872-81072</p> <p>8972 81072 (OPPOSITE SIDE)</p> <p>B3 - Standard Floor</p>	<p>8873-81073 8473-8773</p> <p>B3 - Standard Floor</p>	<p>8873-81073 8473-8773</p> <p>B3 - Standard Floor</p>
<p>8872 (OPPOSITE SIDE)</p> <p>V5 - Vertical Down</p>	<p>8972 81072 (OPPOSITE SIDE)</p> <p>8872 (OPPOSITE SIDE)</p> <p>V5 - Vertical Down</p>	<p>V5 - Vertical Down</p>	<p>V5 - Vertical Down</p>
<p>B6 - LH Wall</p>	<p>B6 - LH Wall</p>	<p>B6 - LH Wall</p>	<p>B6 - LH Wall</p>
<p>B7 - RH Wall</p>	<p>B7 - RH Wall</p>	<p>B7 - RH Wall</p>	<p>B7 - RH Wall</p>
<p>B8 - Ceiling</p>	<p>B8 - Ceiling</p>	<p>B8 - Ceiling</p>	<p>B8 - Ceiling</p>

BREATHER ○ FILLER ▽ FILLER/BREATHER ▽

LEVEL ● DRAIN ● GREASE ZERK □ (8972-81072 SHAFT INPUT)

# TorqueLine™ Helical In-Line

## HELICAL IN-LINE MOUNTING POSITION, FILL, LEVEL AND DRAIN LOCATIONS

FLANGE MOUNT DOUBLE REDUCTION	
GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT
<p>8872-81072    8472-8772</p> <p>B5 - Horizontal</p>	<p>8872-81072    8472-8772</p> <p>8972-81072</p> <p>B5 - Horizontal</p>
<p>V1 - Vertical Down</p>	<p>8972-81072</p> <p>V1 - Vertical Down</p>

FLANGE MOUNT TRIPLE REDUCTION	
GEARMOTOR & MOTORIZED REDUCER	SHAFT INPUT
<p>8873-81073    8473-8773</p> <p>B5 - Horizontal</p>	<p>8873-81073    8473-8773</p> <p>B5 - Horizontal</p>
<p>V1 - Vertical Down</p>	<p>V1 - Vertical Down</p>

BREATHER ○    FILLER ▽    FILLER/BREATHER ▾    LEVEL ⊖    DRAIN ●    GREASE ZERK □  
 (8972-81072 SHAFT INPUT)

# Engineering Data - Helical Bevel Lubrication

Lubrication Recommendations for continuous operation in ambient temperatures of 30° to 125°F (0° to 50°C) and operating temperatures to 185°F (85°C)

Castrol Limited      Chevron Corporation      Citgo Petroleum Corporation      Mobil Corporation      Shell Group of Companies      Texaco, Inc.

Standard Alpha SP 220    Gear Compound EP ISO 220    EP Compound #220    Mobilgear 630    Omala 220    Meropa 220

Note: Grove Gear TorqueLine Reducers are factory filled with lubricant

For ambient temperatures below 30°F (0°C), above 125° (50°C) or intermittent duty contact factory for lubricant recommendation

## Approximate Oil Capacities (Pints) Helical Bevel Triple Reduction

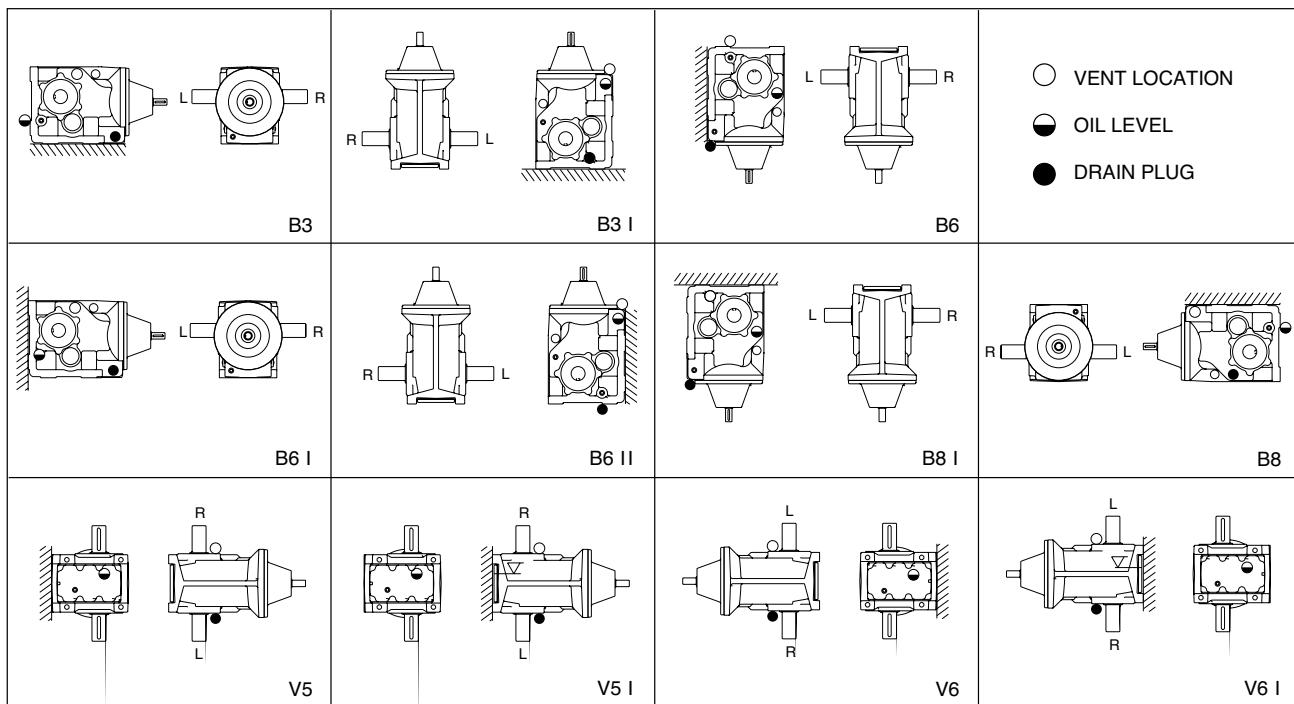
Model	Mounting Position					
	B3 and B6 I*	B3 I and B6 II	B6 and B8 I	V5 and V5 I	V6 and V6 I	B8
K8473	1.3	3.5	Consult Factory	2.6	2.7	2.9
K8673	2.4	7.2	Consult Factory	5.5	5.7	6.0
K8773	3.6	10.8	Consult Factory	8.3	8.6	9.0
K8873	6.7	20.1	Consult Factory	15.4	16.1	17.4
K8973	15	37.8	Consult Factory	29.0	30.3	32.7
K81073	21.0	71.0	Consult Factory	51.0	51.0	54.0

## Approximate Oil Capacities (Pints) Helical Bevel Quin Reduction

Quin reduction units are compound units. The primary and secondary units are filled separately. Refer to the model table below and use the oil capacities shown.

Model	Unit	Input Style	Mounting Position					
			B3 and B6 I*	B3 I and B6 II	B6 and B8 I	V5 and V5 I	V6 and V6 I	B8
K8675	Primary	Shaft Input	1.9	2.5	Consult	1.6	1.6	2.2
	Secondary	N/A	2.4	7.2	Factory	5.5	5.7	6.0
K8675	Primary	'C' Face	1.0	1.4	Consult	1.5	1.5	1.8
	Secondary	N/A	2.4	7.2	Factory	5.5	5.7	6.0
K8775	Primary	Shaft Input	3.0	3.6	Consult	2.4	2.4	3.1
	Secondary	N/A	3.6	10.8	Factory	8.3	8.6	9.0
K8775	Primary	'C' Face	1.6	2.3	Consult	2.3	2.3	3.0
	Secondary	N/A	3.6	10.8	Factory	8.3	8.6	9.0
K8875	Primary	Shaft Input	7.5	7.9	Consult	6.1	6.1	7.8
	Secondary	N/A	6.7	20.1	Factory	15.4	16.1	17.4
K8875	Primary	'C' Face	5.1	5.5	Consult	6.1	6.1	7.4
	Secondary	N/A	6.7	20.1	Factory	15.4	16.1	17.4

### \*Mounting Positions



# Engineering Data - Helical Worm Lubrication

Size 4042 through 4074 Reducers and Gearmotors are filled with gear lubricant at the factory, to the correct level for the mounting position specified on the order. These lubricants are recommended for continuous operation in ambient temperatures of 40° to 100°F (4° to 38° C). For temperatures above or below this range or intermittent duty, contact the factory for lubrication recommendation.

For Double and Triple reduction units and the secondary unit of quad reduction units, use Mobil 600W Cylinder oil, or equivalent worm gear lubricant (ISO VG 460 AGMA 7 Comp.). For the primary unit of quad reduction units, use Mobil 630 gear lubricant or equivalent (ISO VG 220 AGMA 5 EP).

**CAUTION** If the mounting position is changed, the oil quantity must be adjusted to obtain the proper oil level per the Lubrication Instruction enclosed with each unit. Mounting position must be one shown on page 174. Consult the factory if you are not certain of the correct oil level or quantity. Consult the factory for mounting positions not shown.

## Approximate Oil Capacities (Pints) Helical Worm Double Reduction

Model	Mounting Position					
	B3 and B6 I*	B3 I and B6 II	B6 and B8 I	V5 and B5 I	V6 and V6 I	B8
S8472	1.7	2.1	Consult Factory	1.9	1.9	2.4
S8572	2.0	3.7	Consult Factory	3.3	3.3	3.9
S8672	4.3	6.0	Consult Factory	5.3	5.3	5.6
S8772	7.7	12.7	Consult Factory	11.6	11.6	14.0

## Approximate Oil Capacities (Pints) Helical Worm Triple Reduction

Model	Mounting Position					
	B3 and B6 I*	B3 I and B6 II	B6 and B8 I	V5 and B5 I	V6 and V6 I	B8
S8473	2.1	2.8	Consult Factory	2.2	2.2	2.8
S8573	2.8	4.8	Consult Factory	3.9	3.9	4.5
S8673	6.3	8.0	Consult Factory	7.3	7.3	8.3
S8773	11.2	16.2	Consult Factory	15.1	15.1	18.0

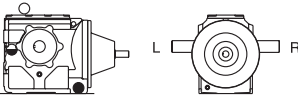
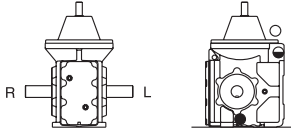
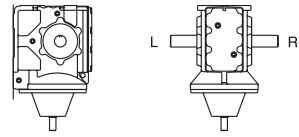
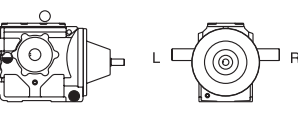
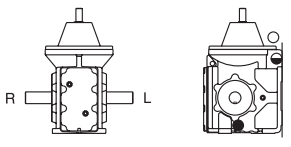
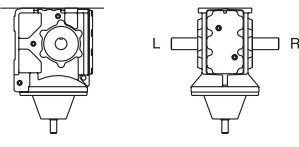
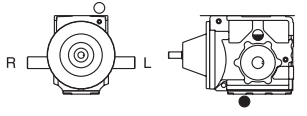
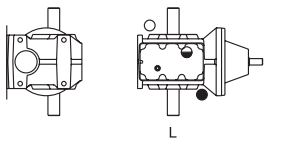
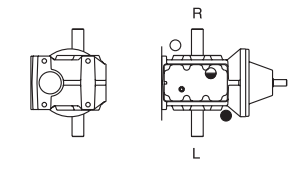
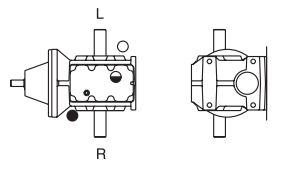
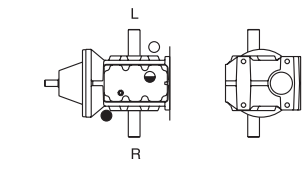
## Approximate Oil Capacities (Pints) Helical Worm Quad Reduction

Quad reduction units are compound units. The primary and secondary units are filled separately. Refer to the model table below and use the oil capacities shown.

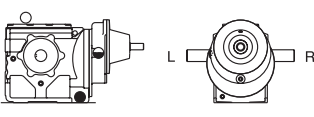
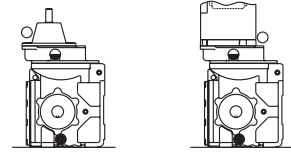
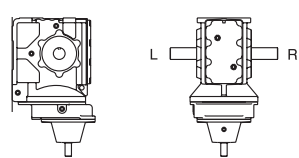
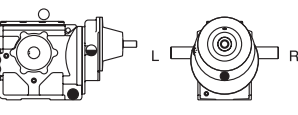
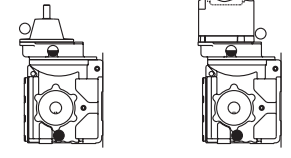
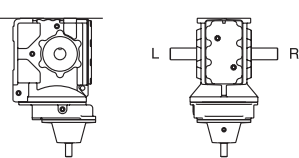
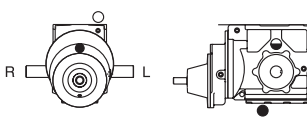
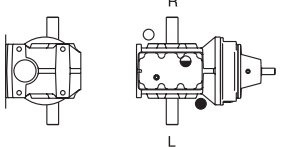
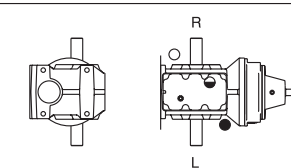
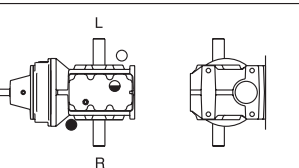
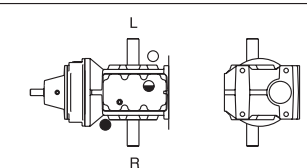
Model	Unit	Input Type	Mounting Position					
			B3 and B6 I*	B3 I and B6 II	B6 and B8 I	V5 and B5 I	V6 and V6 I	B8
S8674	Primary	Solid Input	1.9	2.5	Consult	1.6	1.6	2.2
	Secondary	N/A	4.3	6.0	Factory	5.3	5.3	5.6
S8674	Primary	'C' Face	1.0	1.4	Consult	1.5	1.5	1.8
	Secondary	N/A	4.3	6.0	Factory	5.3	5.3	5.6
S8774	Primary	Solid Input	3.0	3.6	Consult	2.4	2.4	3.1
	Secondary	N/A	7.7	12.7	Factory	11.6	11.6	14.0
S8774	Primary	'C' Face	1.6	2.3	Consult	2.3	2.3	3.0
	Secondary	N/A	7.7	12.7	Factory	11.6	11.6	14.0

# TorqueLine™ Helical Worm

## HELICAL WORM DOUBLE REDUCTION MOUNTING POSITIONS

 <p><b>B3</b></p>	 <p><b>B3 I</b></p>	 <p>CONSULT FACTORY REQUIRES MODIFIED UNIT</p> <p><b>B6</b></p>	<ul style="list-style-type: none"> <li>○ VENT LOCATION</li> <li>● OIL LEVEL</li> <li>● DRAIN PLUG</li> </ul>
 <p><b>B6 I</b></p>	 <p><b>B6 II</b></p>	 <p>CONSULT FACTORY REQUIRES MODIFIED UNIT</p> <p><b>B8 I</b></p>	 <p><b>B8</b></p>
 <p><b>V5</b></p>	 <p><b>V5 I</b></p>	 <p><b>V6</b></p>	 <p><b>V6 I</b></p>

## HELICAL WORM TRIPLE REDUCTION MOUNTING POSITIONS

 <p><b>B3</b></p>	 <p>(SHAFT &amp; QUILL INPUT UNITS) <b>B3 I</b></p> <p>(GEARMOTORS)</p>	 <p>CONSULT FACTORY REQUIRES MODIFIED UNIT</p> <p><b>B6</b></p>	<ul style="list-style-type: none"> <li>○ VENT LOCATION</li> <li>● OIL LEVEL</li> <li>● DRAIN PLUG</li> </ul>
 <p><b>B6 I</b></p>	 <p>(SHAFT &amp; QUILL INPUT UNITS) <b>B6 II</b></p> <p>(GEARMOTORS)</p>	 <p>CONSULT FACTORY REQUIRES MODIFIED UNIT</p> <p><b>B8 I</b></p>	 <p><b>B8</b></p>
 <p><b>V5</b></p>	 <p><b>V5 I</b></p>	 <p><b>V6</b></p>	 <p><b>V6 I</b></p>

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# TorqueLine™ Powermatched Motors

## Standard Cataloged Motor Data 3 Phase (TEFC) 1750 RPM

HP	RPM	VOLTS	Frame	NOM Eff.	(1) F.L. AMPS	Weight LBS	"LQ" Dim.
1/4	1800	208-230/460	56C	66.0	1.3	14	9.94
1/3	1800	208-230/460	56C	68.0	1.6	15	10.19
1/2	1800	208-230/460	56C	68.0	2.2	17	10.69
3/4	1800	208-230/460	56C	75.5	2.8	21	11.19
1	1800	208-230/460	56C	77.0	3.6	27	12.32
1-1/2	1800	208-230/460	56C	80.0	4.8	29	12.32
2	1800	208-230/460	145TC	82.5	5.8	39	13.87
3	1800	208-230/460	182TC	82.5	8.0	76	15.69
5	1800	208-230/460	184TC	86.5	13.0	92	16.69
7-1/2	1800	208-230/460	213TC	87.5	19.4	103	19.46
10	1800	208-230/460	215TC	88.5	25.0	135	20.96
15	1800	208-230/460	254TC	88.5	38.6	179	23.24

Notes: (1) AT 230 VOLTS (2) FRAME IS C FACE WITH RIGID BASE

## Alternate Motor 575 Volt (TEFC) 3 Phase - 1750 RPM

H.P.	Voltage	Frame Size	F.L. AMPS	"LQ" Dimension
1/4	575	56C	0.52	9.94
1/3	575	56C	0.64	10.19
1/2	575	56C	0.90	10.69
3/4	575	56C	1.10	11.19
1	575	56C	1.45	12.32
1-1/2	575	56C	1.90	12.32

Notes: (1) C FACE - FOOTLESS

\*Contact factory for catalog number and model number.

## Alternate Motor 1 Phase (TEFC) 1750 RPM

HP	Voltage	Frame Size	(1)F.L. AMPS	"LQ" Dimension
1/4	115/208-230	56C	8.8	11.19
1/3	115/208-230	56C	6.0	10.44
1/3	115/208-230	56C	8.0	11.19
3/4	115/208-230	56C	11.0	12.32
1	115/208-230	56C	13.4	12.82
1-1/2	115/208-230	56C	15.2	13.82

Notes: (1) AT 115 VOLTS  
(2) CAP. START/CAP. RUN

## Alternate Motor Washdown Duty - TE - 1750 RPM

HP	Phase	Voltage	Frame Size	(2)F.L.AMPS	"LQ" Dim.
1/2	1 (1)	115/208-230	56C	8.8	11.19
1/2	3	208-230/460	56C	1.8	10.60
3/4	1 (1)	115/208-230	56C	10.8	11.69
3/4	3	208-230/460	56C	2.5	10.56
1	1 (1)	115/208-230	56C	12.8	12.19
1	3	208-230/460	56C	3.2	11.56
1-1/2	1 (1)	115/208-230	56C	19.0	13.69
1-1/2	3	208-230/460	56C	4.2	13.06
2	3	208-230/460	56C	6.2	12.69

Notes: (1) CAPACITOR START/INDUCTION RUN  
(2) AT 230 VOLTS 3 PHASE & 115 VOLTS 1 PHASE

\*Contact factory for catalog number and model number.



# Engineering Data

## Alternate Motor (1) Inverter Duty - 20:1 - 1750 RPM - Totally Enclosed

HP	Voltage	Range	Frame Size	(3)F.L.AMPS	"LQ" Dim.
1/4	230	20:1	56C	1.0	9.55
1/3	230	20:1	56C	1.2	9.80
1/2	230/460	20:1	56C	1.8	10.55
3/4	230	20:1	56C	2.8	11.44
1	230	20:1	56C	3.2	12.44
1-1/2	230	20:1	145TC	4.8	13.44
2	230	20:1	145TC	5.8	14.87
3	230	20:1	145TC	8.4	14.87

Notes: (1) 20:1 CONSTANT TORQUE DESIGNED TO REPLACE 90 VOLT AND 180 VOLT PMDC MOTORS  
 (2) C FACE WITH RIGID BASE  
 (3) AT 230 VOLTS

## Alternate Motor (1) Inverter Duty - 2000:1 - 1750 RPM - Totally Enclosed

HP	Voltage	Range	Cat. No.	Model No.	Frame Size	(3)F.L.AMPS	"LQ" Dim.
1	230/460	2000:1	(2)Y525	143THTN8028	143TC	3.0	13.68
2	230/460	2000:1	(2)Y526	145THTN8029	145TC	6.0	14.68
3	230/460	2000:1	(2)Y527	182THTS8028	182TC	8.0	16.12
5	230/460	2000:1	(2)Y564	184THTS8028	184TC	13.4	17.12
7-1/2	230/460	2000:1	(2)Y565	213THTS8038	213TC	21.0	20.56
10	230/460	2000:1	(2)Y566	215THTS8038	215TC	26.0	22.74

Note: (1) VECTOR DUTY, 2000:1 CONSTANT TORQUE, ENCODER PROVISIONS INCLUDED  
 (2) C FACE WITH RIGID BASE  
 (3) AT 230 VOLTS

## Alternate Motor Brake Motors - 1750 RPM - Totally Enclosed

HP	Phase	Voltage	Brake Rating	Frame Size	(3)F.L.AMPS	"LQ" Dim.
1/3	1(1)	115/208-230	3	56C	6.6	16.20
1/3	3	208-230/460	3	56C	1.6	15.73
1/2	1(1)	115/208/230	3	56C	8.8	16.20
1/2	3	208-230/460	3	56C	2.4	15.73
3/4	1(1)	115/208-230	6	56C	11.0	16.70
3/4	3	208-230/460	6	56C	3.1	15.73
1	1(1)	115/208-230	6	56C	13.4	17.20
1	3	208-230/460	6	56C	3.6	17.23
1-1/2	1(2)	115/208-230	10	56C	15.2	18.20
1-1/2	3	208-230/460	10	56C	4.8	17.23
2	3	208-230/460	10	145TC	5.8	17.29

Notes: (1) CAPACITOR START/INDUCTION RUN (2) CAPACITOR START/CAPACITOR RUN (3) AT 230 VOLTS 3 PHASE & 115 VOLTS 1 PHASE

\*Contact factory for catalog number and model number.

# Grove Gear Industrial Gear Drives

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

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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

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# Grove Gear Industrial Gear Drives

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.



Revised January 2005

# Grove Gear Industrial Gear Drives



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 Grove Gear 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 Grove Gear 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. 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, the manufacturer shall have no liability to Buyer for consequential 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 Grove Gear.

# Grove Gear Industrial Gear Drives



Please Read Carefully



This catalog is not intended to provide operational instructions. Appropriate Grove Gear instructions provided with the motor and precautions attached to the motor should be read carefully prior to installation, operation and/or maintenance of the equipment. Injury to personnel or motor failure may be caused by improper installation, maintenance or operation.

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 Grove Gear product:



- Disconnect power and lock out driven equipment before working on a motor.
- Always keep hands and clothing away from moving parts.
- The lifting support on the motor is not to be used to lift the entire machine. Only the motor attached directly to the support may be safely lifted by the support.
- Install and ground per local and national codes.
- Discharge all capacitors before servicing a single phase motor.
- Misapplication of a motor in a hazardous environment can cause fire or an explosion and result in serious injury. Only the end user, local authority having jurisdiction, and/or insurance underwriter are qualified to identify the appropriate class(es), group(s), division and temperature code. Grove Gear personnel can not evaluate or recommend what motors may be suitable for use in hazardous environments. If a motor is name-plated for hazardous locations, do not operate the motor without all of the grease and drain plugs installed.
- Never attempt to measure the temperature rise of a motor by touch. Temperature rise must be measured by thermometer, resistance, imbedded detector or thermocouple.
- Motors with automatic reset thermal protectors will automatically restart when the protector temperature drops sufficiently. Do not use motors with automatic reset thermal protectors in applications where automatic restart will be hazardous to personnel or equipment.
- Motors with manual reset thermal protectors may start unexpectedly after the protector trips when the surrounding air is at +20°Fahrenheit or lower. If the manual reset protector trips, disconnect motor from its power supply. After the protector cools (five minutes or more), it can be reset and power may be applied to the motor.
- Connect all protective device leads, marked P1, P2, etc., per instructions supplied with the motor.
- Operation of a motor at other than its nameplate rating may result in fire, damage to equipment or serious injury to personnel.
- 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.



- Consult qualified personnel with questions and all electrical repairs must be performed by trained and qualified personnel only.
- For motors nameplated as "belted duty only", do not operate the motor without belts properly installed.
- Motors and/or driven equipment should not be operated faster than their rated speed.
- For inverter applications, follow the inverter manufacturer's installation guidelines.
- Make sure the motor is properly secured and aligned before operation.

## Resale of Goods

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 warranty 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. 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, the manufacturer shall have no liability to Buyer for consequential 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 Grove Gear.