



# Shaft-Mounted Planetgear (SMP)

(Inch)

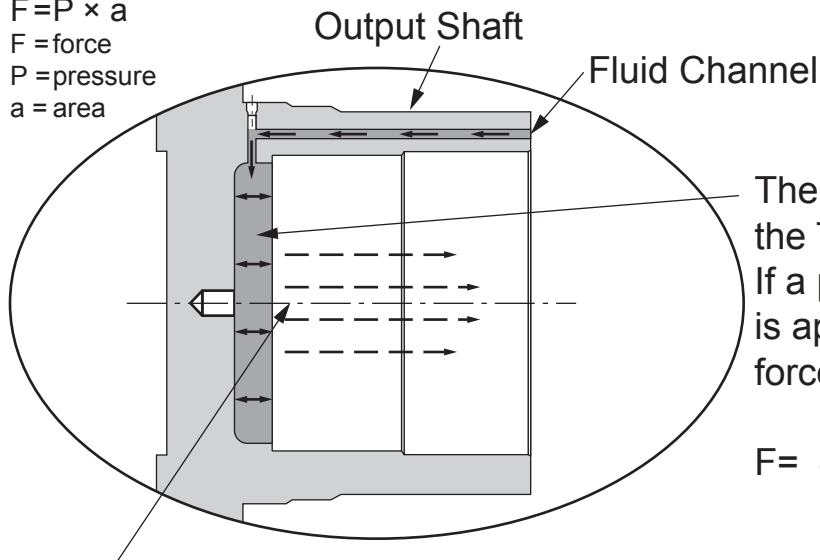


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## Hydraulic Remove System (Hydro-Advantage)

$F = P \times a$   
F = force  
P = pressure  
a = area



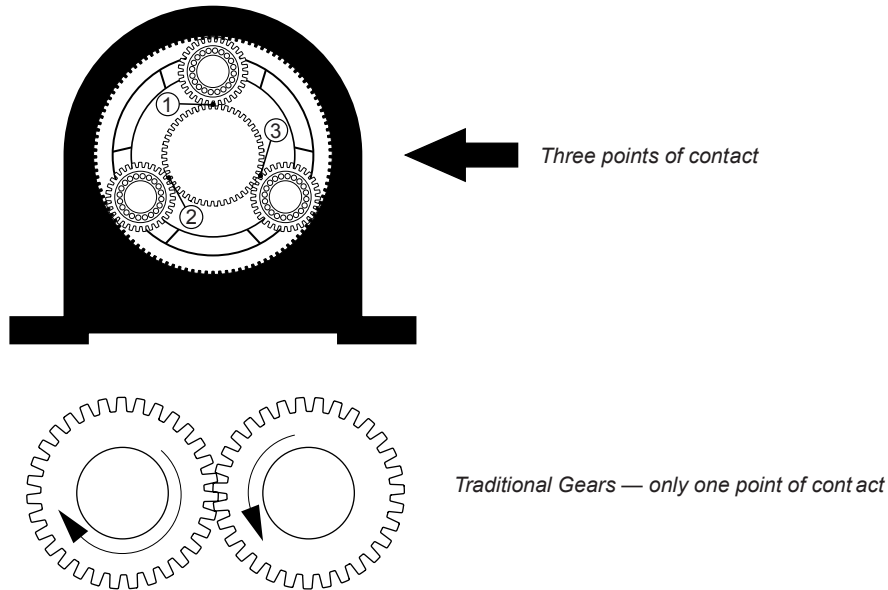
The area in yellow on the Titan = 20 in<sup>2</sup>  
If a pressure of 4,500 psi is applied the resultant force = 90,000 lbs

$$F = 4500 \text{ lbs/in}^2 \times 20 \text{ in}^2$$

Fluid is pumped behind the shaft filling this section. The force is at the best possible location, between the driven shaft and reducer shaft.

## PROVEN, RELIABLE GEAR PERFORMANCE

With Planetgear reducers, self-aligning planet carriers float radially and axially to provide perfect alignment of the gear train. Unlike "traditional gears" which have only one point of contact per reduction, Planetgear transmits the torque through three points of contact between sun gears and planet gears. The floating gear train ensures equal loading among the three points. State of the art heat-treating techniques provide hardened, wear-resistant gearing.

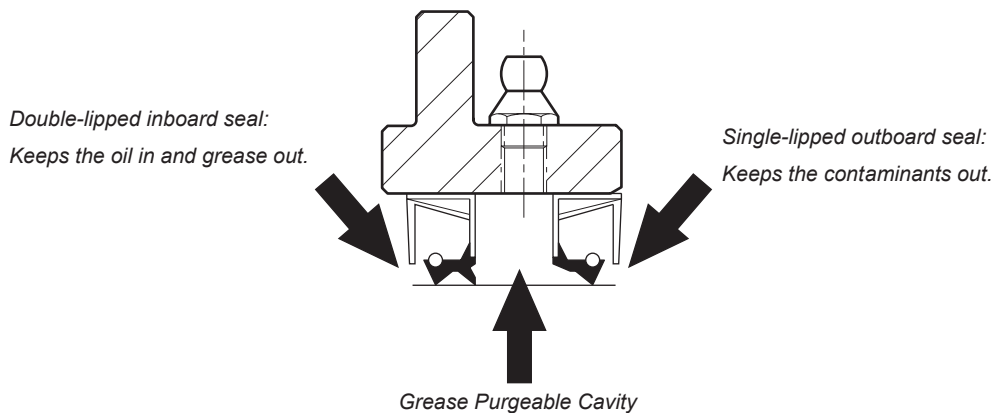


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## SUPERIOR SEAL PROTECTION

How many reducer failures are attributed to bearing contamination?

Planetgear reducers are designed with TWO seals on both the input and output shafts. Our successful seal layout can be seen in the schematic shown below.



Planetgear reducers assure you extended reducer service-life even in the worst environments.

# SELECTION PROCEDURES

## Introduction

Selection of Planetgear is based on the required output torque capacity of the application. The service factor method illustrated below is used to apply industry application standards based on the hours per day of operation. These application standards (service factors) are cataloged and have been developed based on practical application experience.

The following is an example of this procedure.

### Information Required To Make Reducer Selection

- The specific application and hours per day of operation.
- Reducer input speed.
- Input Horsepower.
- Desired reducer output speed.
- If applicable, overhung load.

### Step 1 — Determine Service Factor

Select the appropriate service factor Table 1 on pages 6 & 7 for the industry and specific applications at hand. These service factors are designed for applications driven by electric motors.

Steam & Gas Turbines Hydraulic or Electric Motors	Single Cylinder Engines	Multi-Cylinder Engines
1.00	1.50	1.25
1.25	1.75	1.50
1.50	2.00	1.75
1.75	2.25	2.00
2.00	2.50	2.25

If a single or multiple cylinder engine is used, adjust the service factor that is taken from Table 1 with the corresponding values listed above.

Rating tables are available for horizontal mounting and input speeds of 1750, 1430, 1170 and 870 rpm. Continue with the selection procedures as follows:

### Step 2 — Calculate the desired reducer ratio (D.R.) using:

$$D.R. = \frac{\text{Input Speed (RPM)}}{\text{Output Speed (RPM)}}$$

### Step 3 — Select closest nominal ratio (N.R.)

Reference pages 10-14. Pick the ratio that is closest to the desired ratio calculated in Step 2.

### Step 4 — Calculate equivalent output torque (E.O.T.) using:

A. When input motor horsepower is known:

Note: 59,900 is used to represent the average mechanical efficiency of reducers (59,900 = 63,025 x 95%).

$$\frac{E.O.T.}{RPM} = \frac{HP \times N.R. \times S.F. \times 59,900}{in}$$

B. Where required output torque is known:

where:

$$E.O.T. = T_o \times S.F.$$

- HP = Motor horsepower
- N.R. = Nominal ratio from Step 3
- S.F. = Service factor from Step 1
- RPM<sub>in</sub> = Reducer input shaft speed in revolutions per minute
- T<sub>o</sub> = Output torque required in lb-in

### Step 5 — Select reducer

Using the nominal ratio determined from Step 3. Locate the smallest series that offers the output torque (lb-in) rating that is equal to or greater than the equivalent output torque (E.O.T.) determined from Step 4 for the nominal ratio required.

### Step 6 — Check thermal capacity

The motor horsepower capacity must be compared to the thermal capacity of the reducer. Refer to Table 3 respectively, on page 15 and select the rating without fan which corresponds to the reducer series and nominal ratio required. If the nominal ratio is not listed, your application will not be thermally limited with respect to horsepower. If no horsepower is listed under the nominal ratio, your application will not be thermally limited with respect to horsepower. If a number is listed, it may need to be adjusted based on application details before comparing against the motor rating. Use the following formula for comparison:

$$\text{Motor HP Rating vs. } (T_r)(A_c)$$

where:

T<sub>r</sub> = Thermal rating - Table 3, pages 15

A<sub>c</sub> = Ambient Temperature Adjustment Factor Table 4, page 15

If the motor horsepower exceeds this rating, refer back to Table 3 page 15 and check the thermal rating under the with fan column. If no number is listed under the nominal ratio, your application will not be thermally limited with respect to horsepower with a cooling fan. If a number is listed recalculate the thermal rating with fan (T<sub>r</sub>) and compare to the motor horsepower. If the motor horsepower is less than or equal to the rating, your application will not be thermally limited with respect to horsepower with a cooling fan. If your motor horsepower exceeds this rating, contact the factory to review the possibility of increasing the thermal capacity by use of a heat exchanger. Thermal ratings can be ignored if continuous running time does not exceed idle time on a per hour basis.

### Step 7 — Check dimensions

Dimensional drawings for reducers with and without accessories are found on pages 17 to 21.

### Step 8 — Ordering reducers

See reducer order form page 24.

# SELECTION PROCEDURES

## When motor horsepower is known:

A 75 hp 1,750 rpm motor in a 356T frame is used to drive a heavy duty bucket elevator 24 hrs/day with a 6<sup>7/16</sup>" head shaft. The application requires a reducer that is hollow shaft mounted with an output speed of 18 rpm. A motor will be mounted on top of the reducer and driven by a 2.25:1 v-belt drive into the reducer. The pitch diameter of the sheave mounted on the reducer input shaft is 16". The centerline will be positioned at 2.25" from the input shaft seal carrier. In addition, the customer has requested an internal backstop and input shaft belt guard.

### Step 1 — Select service factor

From Table 1 on pages 6 and 7, the service factor for a heavy duty bucket elevator 24 hrs/day operation is 1.5.

### Step 2 — Calculate desired ratio (D.R.)

$$\text{Reducer Input Speed} = \frac{\text{Motor RPM}}{\text{Belt Drive Ratio}} = \frac{1750}{2.25} = 778 \text{ RPM input}$$

$$\text{D.R.} = \frac{778 \text{ RPM}}{18 \text{ RPM}} = 43.22$$

### Step 3 — Select closest nominal ratio (N.R.)

Reference pages 10-14. Select nominal ratio = 43.78

$$\text{Output Speed} = \frac{778 \text{ RPM}}{43.78} = 17.8 \text{ RPM}$$

### Step 4 — Calculate equivalent output torque (E.O.T.) hp method

$$\text{E.O.T.} = \frac{75 \text{ hp} \times 43.78 \text{ N.R.} \times 1.5 \text{ S.F.} \times 59,900}{778 \text{ (input RPM)}} = 379,206 \text{ lb.-in.}$$

### Step 5 — Select reducer

Reference pages 10 and 11. The Orion rates for 263,205 lb-in and the Titan rates for 471,737 lb-in. The smallest series that meets the E.O.T. calculated in Step 4 is the Titan.

### Step 6 — Check thermal capacity

Compare the motor horsepower to the thermal ratings of the reducers with the following formula:

$$\text{Motor HP} \leq (T_r)(A_c)$$

Using the 870 RPM input speed from the thermal rating Table 3 page 15 is 43.78:1 ratio  $T_r$  without fan = 110.

$$A_c = 1.0$$

$$75 \text{ (Motor HP)} \leq 110 \text{ (thermal rating)}(1.0)$$

$$75 < 110$$

The motor horsepower is less than the thermal rating.

### Step 7 — Check dimensions

Dimensions for the Titan on page 17 & 18 for available hollow bore sizes and reducer dimensions, page 19 for top motor mount detail and page 20 for belt guard detail.

### Step 8 — Order Shaft Mounted Planetgear reducer

Create the model number using pages 8 & 9. The correct model number is WQEA04333664.

## When required output torque is known:

A heavy duty apron conveyor is operating 24 hrs/day. The conveyor requires a reducer with a 3.7 rpm output speed and 1,600,000 lb-in output torque. The reducer will be driven by a 100 hp motor in a 405T frame with a 1750 rpm base speed. The v-belt drive ratio is 2:1 with an 18" diameter sheave on the reducer input shaft 3" from the seal carrier.

### Step 1 — Select service factor

From Table 1 on pages 6 & 7, the service factor for a heavy duty apron conveyor 24 hrs/day operation is 1.50.

### Step 2 — Calculate desired ratio (D.R.)

### Step 3 — Select closest nominal ratio (N.R.)

Reference pages 10-14. Select nominal ratio = 238.2

### Step 4 — Calculate equivalent output torque (E.O.T.)

Since output torque is known:

$$\text{E.O.T.} = 1,600,000 \text{ (output torque in lb.-in.)} \times 1.5 \text{ (service factor)} = 2,400,000 \text{ lb.-in.}$$

### Step 5 — Select reducer

Using rating selection on pages 10 to 14. With nominal ratio is 238.2, the smallest series listed for the E.O.T. calculated in Step 4 (2,400,000 lb.-in.) is a Hercules at 2,995,000 lb.-in.

### Step 6 — Order SMP reducer

See reducer order form on page 24.

# SELECTION PROCEDURES

## NON-MOTORIZED SELECTION

### TABLE 1 - SERVICE FACTORS

APPLICATION	SERVICE		APPLICATION	SERVICE		APPLICATION	SERVICE	
	10 HRS/DAY	24 HRS/DAY		10 HRS/DAY	24 HRS/DAY		10 HRS/DAY	24 HRS/DAY
AGITATORS			Clay Working Machinery	1.25	1.50	FANS		
Pure Liquids	1.00	1.25	Pug Mills	1.25	1.50	Centrifugal	1.00	1.25
Liquids & Solids	1.25	1.50	COLLECTORS (Sewage)	1.00	1.25	Cooling Towers	*	*
Liquids - Variable Density	1.25	1.50				Forced Draft	-	1.25
APRON CONVEYORS			COMPRESSORS			Induced Draft	1.25	1.50
Uniformly Loaded or Fed	1.00	1.25	Centrifugal	1.00	1.25	Large (Mine, etc.)	1.25	1.50
Heavy Duty	1.25	1.50	Lobe	1.25	1.50	Large (Industrial)	1.25	1.50
APRON FEEDERS	1.25	1.50	Reciprocating			Light (Small Diameter)	1.00	1.25
ASSEMBLY CONVEYORS			Multi-Cylinder	1.50	1.75	FEEDERS		
Uniformly Loaded or Fed	1.00	1.25	Single Cylinder	2.25	2.50	Apron, Belt	1.25	1.50
Heavy Duty	1.25	1.50	CONCRETE MIXERS			Disc	1.00	1.25
BALL MILLS	**	**	Continuous	1.25	1.50	Reciprocating	1.75	2.00
BARGE HAUL PULLERS	1.75	2.00	Intermittent	1.25	1.50	Screw	1.25	1.50
BARKING			CONVEYORS - Uniformly			FLIGHT		
Drums (coupling connected)	-	2.00	Loaded or Fed: Apron,			Conveyors, Uniform	1.00	1.25
Mechanical	-	2.00	Assembly, Belt, Bucket, Chain			Conveyors, Heavy	1.25	1.50
BAR SCREENS (Sewage)	1.00	1.25	Flight, Oven, Screw	1.00	1.25	FOOD INDUSTRY		
BATCHERS (Textile)	1.25	1.50	CONVEYOR - Heavy Duty			Beet Slicers	1.25	1.50
BELT CONVEYORS			Not Uniformly Fed: Apron,			Bottling, Can Filling Mach	1.00	1.25
Uniformly Loaded or Fed	1.00	1.25	Assembly, Belt, Bucket, Chain			Cereal Cookers	1.00	1.25
Heavy Duty	1.25	1.50	Flight, Oven, Screw	1.25	1.50	Dough Mixers, Meat Grinders	1.25	1.50
BELT FEEDERS	1.25	1.50	CONVEYOR - Severe Duty			GENERATORS (Not Welding)	1.00	1.25
BENDING ROLLS (Machine)	1.25	1.50	Live Roll	*	*	GRAVITY DISCHARGE		
BLOWERS			Reciprocating, Shaker	1.75	2.00	ELEVATORS	1.00	1.25
Centrifugal	1.00	1.25	COOKERS (Brewing & Distilling)			HAMMER MILLS	1.75	2.00
Lobe	1.25	1.50	(Food)	1.00	1.25	HOISTS		
Vane	1.00	1.25	COOLING TOWER FANS	*	*	Heavy Duty	1.75	2.00
BOTTLING MACHINERY	1.00	1.25	CRANES			Medium Duty	1.25	1.50
BREWING & DISTILLING			Dry Dock Cranes	◆	◆	Skip Hoist	1.25	1.50
Bottling Machinery	1.00	1.25	Main Hoist	*	*	INDUCED DRAFT FANS	1.25	1.50
Brew Kettles, Cont. Duty	1.00	1.25	Bridge and Trolley Travel	*	*	KILNS	**	**
Can Filling Machines	1.00	1.25	CRUSHERS			LAUNDRY WASHERS & TUMBLERS	1.25	1.50
Cookers, Cont. Duty	1.00	1.25	Ore or Stone	1.75	2.00	LINE SHAFTS		
Mash Tubs, Cont. Duty	1.00	1.25	Sugar	-	1.50	Driving Processing Equip	1.25	1.50
Scale Hoppers, Freq. Starts	1.25	1.50	DEWATERING SCREENS			Other Line Shafts, Light	1.00	1.25
BRICK PRESS (Clay Working)	1.75	2.00	(Sewage)	1.25	1.50	LIVE ROLL CONVEYORS	*	*
BRIQUETTE MACHINES			DISC FEEDERS	1.00	1.25	LOBE BLOWERS OR COMPRESSORS	1.25	1.50
(Clays Working)	1.75	2.00	DISTILLING (See Brewing)			LOG HAULS (Lumber)		
BUCKET			DOUBLE ACTING PUMPS			Incline-well Type	1.75	1.75
Conveyors Uniform	1.00	1.25	2 or More Cylinders	1.25	1.50	LOOMS (Textile)	1.25	1.50
Conveyors Heavy Duty	1.25	1.50	Single Cylinder	*	*	LUMBER INDUSTRY		
Elevators Cont.	1.00	1.25	DOUGH MIXER (Food)	1.25	1.50	Barkers - Spindle Feed	1.25	1.50
Elevators Uniform	1.00	1.25	DRAW BENCH (Metal Mills)			Barkers - Main Drive	1.75	1.75
Elevators Heavy duty	1.25	1.50	Carriage & Main Drive	1.25	1.50	Carriage Drive	*	*
CALENDERS			DREDGES			Chain - Floor	1.50	1.50
Rubber	1.50	1.50	Cable Reels, Conveyors	1.25	1.50	Chains - Green	1.50	1.75
Textile	1.25	1.50	Cutter Head & Jig Drives	1.75	2.00	Conveyors		
CAN FILLING MACHINES	1.00	1.25	Maneuvering Winches, Pumps	1.25	1.50	Burner	1.25	1.50
CANE KNIVES	1.50	1.50	Screen Drives	1.75	2.00	Main or Heavy Duty	1.50	1.50
CARD MACHINES (Textile)	1.25	1.50	Stackers, Utility Winches	1.25	1.50	Main Log	1.75	2.00
CAR DUMPERS	1.75	2.00	DRY DOCK CRANES	◆	◆	Re-Saw Merry-Go-Round	1.25	1.50
CAR PULLERS	1.25	1.50	DRYERS & COOLERS			Slab	1.75	2.00
CEMENT KILNS	**	**	(Mills, Rotary)	-	1.50	Transfer	1.25	1.50
CENTRIFUGAL			DYEING MACHINERY			Cut-Off Saws Chain & Drag	1.50	1.75
Blowers, Compressors,			(Textile)	1.25	1.50	Debarking Drums	1.75	2.00
Discharge Elevators,			ELEVATORS			Feeds - Edger	1.25	1.50
Fans or Pumps	1.00	1.25	Bucket - Uniform Load	1.00	1.25	Feeds - Gang	1.75	1.75
CHAIN CONVEYORS			Bucket - Heavy Duty	1.25	1.50	Feeds - Trimmer	1.25	1.50
Uniformly Loaded or Fed	1.00	1.25	Bucket - Continuous	1.00	1.25	Log Deck	2.00	2.00
Heavy Duty	1.25	1.50	Centrifugal Discharge	1.00	1.25	Log Hauls- Incline-well type	1.75	1.75
CHEMICAL FEEDERS			Escalators	*	*	Log Turning devices	1.75	1.75
(Sewage)	1.00	1.25	Freight	*	*	Planer Feed	1.25	1.50
CLARIFIERS	1.00	1.25	Gravity Discharge	1.00	1.25	Planer Tilting Hoists	1.50	1.50
CLASSIFIERS	1.25	1.50	Man Lifts, Passenger	*	*	Rolls, Live Off Bearing		
CLAY WORKING INDUSTRY			EXTRUDERS □	□	□	Roll Cases	1.75	1.75
Brick Press	1.75	2.00				Sorting, Table, Tipple Hoist	1.25	1.50
Briquette Machines	1.75	2.00				Transfers - Chain & Craneway	1.50	1.75

◆ DRY DOCK CRANES (Hammerhead, Rotating and Whirler, Stationary or Moving) for any duration of service: Main Hoist, Auxiliary Hoist, Boom (Lifting): 3.00 S.F.; Rotating (Swing or Slew): 3.00 S.F.; Tracking (Drive Wheels): 3.00 S.F.

● Service factors for paper mill application are applied to nameplate rating of electric motor at the motor rated base speed - consistent with TAPPI Standards.

△ When a super calender operates over a speed range of part constant hp and torque and the constant hp speed range is greater than 1.5:1, use a service factor of 1.0 at base speed. When operating at constant torque over the entire speed range or when the constant hp speed range is less than 1.5:1 a 1.25 factor should be applied.

\* Consult Factory.    \*\* See Mills, Rotary.    ■ Using anti-friction bearings only.    □ See Rubber & Plastics Industries

# SELECTION PROCEDURES

## NON-MOTORIZED SELECTION

### TABLE 1 - SERVICE FACTORS (CONT.)

APPLICATION	SERVICE		APPLICATION	SERVICE		APPLICATION	SERVICE	
	10 HRS/DAY	24 HRS/DAY		10 HRS/DAY	24 HRS/DAY		10 HRS/DAY	24 HRS/DAY
Tray Devices	1.25	1.50	Couch Rolls	-	1.25	Mills (3 on line)	1.25	1.25
Veneer Lathe Drives	*	*	Cutter	-	2.00	Mixing Mills	1.50	1.50
MACHINE TOOLS			Cylinder Molds	-	1.25	Refiners & Sheeters	1.50	1.50
Auxiliary Drives	1.00	1.25	Dryers ■ -			SAND MULLERS	1.25	1.50
Bending Rolls	1.25	1.50	Paper Machine & Conveyor Type	-	1.25	SCREENS		
Main Drives	1.25	1.50	Embosses	-	1.25	Air Washing	1.00	1.25
Notching Press (Belted)	*	*	Extruder	-	1.50	Rotary ♂ Stone or Gravel	1.25	1.50
Plate Planers	1.75	2.00	Foundrinier Rolls⊕			Traveling Water Intake	1.00	1.25
Punch Press (Geared)	1.75	2.00	Lumberbreaker, Wire Turning, Dandy			SCREW CONVEYORS		
Tapping Machines	1.75	2.00	& Return Rolls	-	1.25	Uniform	1.00	1.25
MANGLE (Textile)	1.25	1.50	Jordan	-	1.50	Heavy Duty or Feeder	1.25	1.50
MAST TUBS (Brewing & Distilling)	1.00	1.25	Kiln Drive	-	1.50	SCUM BREAKERS (Sewage)	1.25	1.50
MEAT GRINDERS (Food)	1.25	1.50	Mt. Hope & Paper Rolls	-	1.25	SEWAGE DISPOSAL		
METAL MILLS			Platter	-	1.50	Bar screens	1.00	1.25
Draw Bench Carriages & Main Drives	1.25	1.50	Presses (Felt & Suction)	-	1.25	Chemical Feeders	1.00	1.25
Pinch, Dryer & Scrubber	*	*	Pulper - continuous	-	1.50	Collectors	1.00	1.25
Rolls Reversing	*	*	Repulper - heavy stock	-	2.00	Dewatering Screens	1.25	1.50
Slitters	1.25	1.50	Vacuum Pumps	-	1.50	Scum Breakers	1.25	1.50
Table Conveyors			Reel (Surface Type)	-	1.25	Slow or Rapid Mixers	1.25	1.50
Non-Reversing			Screens -			Thickeners	1.25	1.50
Group drives	1.25	1.50	Chip, Rotary	-	1.50	Vacuum Filters	1.25	1.50
Individual	1.75	2.00	Vibrating	-	2.00	SHAKER CONVEYORS	1.75	2.00
Reversing	*	*	Size Press	1.25	1.25	SINGLE ACTING PUMPS		
Wire Drawing & Flattening Machines	1.25	1.50	Super Calender Δ	-	1.25	1 or 2 Cylinders	*	*
Wire Winding Machines	1.25	1.50	Thickener & Washer -			3 or more Cylinders	1.25	1.50
MILLS, ROTARY			AC Motor	-	1.50	SKIP HOIST	1.25	1.50
Ball and Rod Mills			DC Motor	-	1.25	SLAB PUSHERS	1.25	1.50
with Spur Ring Gear	-	2.00	Wind & Unwind Stand	-	1.00	SLITTERS (Metal Mills)	1.25	1.50
with Helical Ring Gear	-	1.50	Winders (Surface Type)	-	1.25	SLUDGE COLLECTORS		
Direct connected	-	2.00	Yankee Dryers ⇄	-	1.25	(Sewage)	1.00	1.25
Kilns, Dryers, Coolers	*	*	PASSENGERS ELEVATORS	*	*	SOAPERS (Textile)	1.25	1.50
Pebble, Plain & Cement Kilns	*	*	PEBBLE MILLS	-	1.50	SPINNERS (Textile)	1.25	1.50
Wedge bar	-	1.50	PLASTIC INDUSTRY □	□	□	STEERING GEARS	*	*
Tumbling Barrels	1.75	2.00	PLATE PLANNERS	1.75	2.00	STOKERS	1.00	1.25
MIXERS (Also see Agitators)			PRINTING PRESSES	*	*	STONE CRUSHERS	1.75	2.00
Concrete, Cont.	1.25	1.50	PROPORTIONING PUMPS	1.25	1.50	SUGAR INDUSTRY		
Concrete, Int.	1.25	1.50	PUG MILLS (Clay)	1.25	1.50	Cane, Knives, Crushers	1.50	1.50
Constant Density	1.00	1.25	PULLERS (Barge Haul)	1.75	2.00	Mills (low speed end)	2.00	2.00
Variable Density	1.25	1.50	PUMPS			TABLE CONVEYORS		
NAPPERS (Textile)	1.25	1.50	Centrifugal	1.00	1.25	(Non-Reversing)		
OIL INDUSTRY			Proportioning	1.25	1.50	Group Drives	1.25	1.50
Chillers	1.25	1.50	Reciprocating ♂ Single Action	1.25	1.50	Individual Drives	1.75	2.00
Oil Well Pumping	*	*	Reciprocating ♂ Dbl Action	1.25	1.50	Reversing	*	*
Paraffin Filter Press	1.25	1.50	2 or More Cylinders	1.25	1.50	TENTER FRAMES (Textile)	1.25	1.50
Rotary Kilns	1.25	1.50	Reciprocating ♂ Single Action			TEXTILE INDUSTRY		
ORE CRUSHERS	1.75	2.00	1 or 2 Cylinders	*	*	Batchers, Calendars	1.25	1.50
OVEN CONVEYORS			Reciprocating ♂ Dbl Action			Card Machines	1.25	1.50
Uniform	1.00	1.25	1 Cylinder	*	*	Dry Cans, Dryers	1.25	1.50
Heavy Duty	1.25	1.50	Rotary Gear, Lobe, Vane	1.00	1.25	Dyeing Machinery	1.25	1.50
PAPER MILLS ●			PUNCH PRESSES			Knitting Machinery	*	*
Agitator (Mixer)	-	1.50	(Gear Driven)	1.75	2.00	Looms, Mangles, Nappers, Pads	1.25	1.50
Agitator for Pure Liquors	-	1.25	RECIPROCATING			Range Drives	*	*
Barking Drums, Barkers ♂			Conveyors, Feeders	1.75	2.00	Slashers, Soapers, Spinners	1.25	1.50
Mechanical	-	2.00	RECIPROCATING			Tenter Frames, Washers,		
Beater	-	1.50	COMPRESSORS			Winders	1.25	1.50
Breaker Stack	-	1.25	Multi-Cylinder	1.25	1.50	THICKENERS (Sewage)	1.25	1.50
Calender ■	-	1.25	Single-Cylinder	2.25	2.50	TUMBLING BARRELS	1.75	2.00
Chipper	-	2.00	ROD MILLS	**	**	VACUUM FILTERS (Sewage)	1.25	1.50
Chip Feeder	-	1.50	ROTARY			VANE BLOWERS	1.00	1.25
Coating Rolls	-	1.25	Pumps	1.00	1.25	WINCHES (Dredges)	1.25	1.50
Conveyors -			Screens (Stone or Gravel)	1.25	1.50	WINDERS (Textile)	1.25	1.50
Chip, Bark, Chemical	-	1.25	RUBBER & PLASTICS INDUSTRIES			WINDLASS	*	*
Log (Including Slab)	-	2.00	Calenders	1.50	1.50	WIRE		
			Crackers	2.00	2.00	Drawing Machines	1.25	1.50
			Mills (2 on line)	1.50	1.50	Winding Machines	1.25	1.50

◆ DRY DOCK CRANES (Hammerhead, Rotating and Whirler, Stationary or Moving) for any duration of service: Main Hoist, Auxiliary Hoist, Boom (Lifting): 3.00 S.F.; Rotating (Swing or Slew): 3.00 S.F.; Tracking (Drive Wheels): 3.00 S.F.

● Service factors for paper mill application are applied to nameplate rating of electric motor at the motor rated base speed - consistent with TAPPI Standards.

Δ When a super calender operates over a speed range of part constant hp and torque and the constant hp speed range is greater than 1.5:1, use a service factor of 1.0 at base speed. When operating at constant torque over the entire speed range or when the constant hp speed range is less than 1.5:1 a 1.25 factor should be applied.

\* Consult Factory. \*\* See Mills, Rotary. ■ Using anti-friction bearings only. □ See Rubber & Plastics Industries



# NOMENCLATURE

(1 — 2 — 3 — 4 — 5 — 6 — 7 — 8 — 9 — 10 — 11 — 12 — 13 — 14 — 15)

TABLE 2 – PART NUMBER SCHEMA AND PROCESSES FOR USER CONFIGURABLE UNITS

<b>1. Reducer</b>	<b>Series</b>	W Orion T Titan J Jupiter G Gemini H Hercules
<b>2 Reducer</b>	<b>Description</b>	A Standard B Backstop C Non-Horizontal D Non-Horizontal w/Backstop E Integral F Non-Horizontal Integral
<b>3 Accessories</b>		A No Accessories B Scoop Mount with Omega Coupling E Motor Mount K Special P Scoop Mount without High Speed Coupling V Motor Mount with Belt Guard
<b>4 Shaft</b>	<b>Option</b>	A Input/Output Standard B Input/Output Standard w/Fan & Shroud C Input Modified D Input Modified w/Fan & Shroud E Output Modified F Output Modified w/Fan & Shroud G Input/Output Modified H Input/Output Modified w/Fan & Shroud S Heavy-Duty Input T Heavy-Duty Input w/Fan & Shroud
<b>5 - 9</b>	<b>Gear Code</b>	000XX Double 00XXX Triple 0XXXX Quad XXXXX Quint

## NOMENCLATURE (cont)

<b>10 - 11</b>	<b>Motor Frame Size - NEMA</b>	00 None 05 56 14 143/145T 18 182/184T 21 213/215T 25 254/256T 28 284/286T 32 324/326T 36 364/365T 40 404/405T 44 444/445T 47 447/449T ZZ Special
<b>10 - 11</b>	<b>Motor Frame Size - IEC</b>	00 None 80 80 90 90S&L 11 112M 13 132S&L 16 160M&L 17 180M&L 20 200L 22 225S 23 225L
<b>12</b>	<b>Hollow Shaft Bore Size</b>	F 5.313" G 5.437" H 5.708" I 6.299" J 6.436" K 6.692" L 7.480" M 7.874" N 9.843" O 11.811" Z Special
<b>13</b>	<b>Mounting Position</b>	1 B3 2 B6 3 B7 4 B8 5 V5 6 V6 Z Special
<b>14</b>	<b>Input Shaft Rotation</b>	1 Clockwise 2 Counter - Clockwise X No Backstop
<b>15</b>	<b>Revision</b>	A

## ORION RATINGS

Nominal Ratio	ORION		1750			1450			1170			870		
	Exact Ratio	Gear Code	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE
11.02	11.02	00033	158.8	371	140	131.6	325	148	106.2	280	158	79.0	227	172
13.85	13.66	00043	128.1	310	145	106.2	273	154	85.7	235	164	63.7	190	179
17.21														
20.41	19.05	00063	91.9	236	154	76.1	207	163	61.4	178	174	45.7	145	190
24.00														
31.63	31.37	00323	55.8	152	159	46.2	133	168	37.3	114	179	27.7	93.1	196
36.56	36.57	00333	47.9	164	200	39.7	144	212	32.0	124	226	23.8	101	247
43.78	45.33	00433	38.6	141	214	32.0	124	226	25.8	106	241	19.2	86.7	264
54.45	56.18	00443	31.1	118	222	25.8	103	234	20.8	89.1	250	15.5	67.3	254
64.42	63.23	00633	27.7	112	236	22.9	98.1	250	18.5	84.3	266	13.8	64.1	272
69.63	68.20	00373	25.7	90.1	205	21.3	75.0	206	17.2	61.1	208	12.8	45.9	210
80.01	78.37	00643	22.3	93.7	245	18.5	80.4	254	14.9	64.9	254	11.1	48.5	255
91.41	84.54	00473	20.7	73.4	207	17.2	61.1	208	13.8	49.8	210	10.3	37.3	212
99.38	104.12	03323	16.8	49.9	169	13.9	43.8	179	11.2	37.7	191	8.4	30.7	209
111.5	109.32	00663	16.0	58.4	213	13.3	48.6	214	10.7	39.2	214	8.0	29.3	215
121.4	121.37	03333	14.4	49.9	197	11.9	43.6	208	9.6	37.6	222	7.2	30.7	244
138.5	129.06	03423	13.6	49.8	209	11.2	43.8	222	9.1	37.6	236	6.7	30.7	259
159.8	150.44	03433	11.6	49.8	244	9.6	43.7	258	7.8	37.6	275	5.8	27.8	274
174.8	180.03	03623	9.7	45.4	266	8.1	39.5	279	6.5	31.8	279	4.8	23.8	280
193.1	186.48	04433	9.4	41.7	253	7.8	37.4	274	6.3	30.2	274	4.7	22.5	275
206.2	209.86	03633	8.3	40.1	274	6.9	32.5	268	5.6	26.8	274	4.1	20.0	275
238.2	223.16	04623	7.8	38.4	279	6.5	31.8	279	5.2	25.8	280	3.9	19.2	280
265.4	260.13	04633	6.7	32.4	274	5.6	26.8	274	4.5	21.7	275	3.3	16.1	275
295.7	311.30	06623	5.6	27.5	279	4.7	22.9	280	3.8	18.5	280	2.8	13.7	280
330.1	345.59	04643	5.1	22.8	257	4.2	18.9	257	3.4	15.3	257	2.5	11.4	258
369.8	362.87	06633	4.8	23.3	275	4.0	19.3	275	3.2	15.6	275	2.4	11.6	275
412.1	402.84	33333	4.3	21.5	275	3.6	17.8	275	2.9	14.4	275	2.2	10.7	275
459.0	449.79	06643	3.9	17.6	257	3.2	14.5	257	2.6	11.8	258	1.9	8.8	258
532.5	531.01	44323	3.3	16.3	275	2.7	13.8	280	2.2	11.1	280	1.6	8.3	280
617.9	618.97	44333	2.8	14.0	275	2.3	11.6	275	1.9	9.4	275	1.4	7.0	276
660.6	696.55	63333	2.5	12.4	275	2.1	10.3	275	1.7	8.3	276	1.2	6.2	276
741.2	767.25	44433	2.3	11.3	275	1.9	9.4	275	1.5	7.6	276	1.1	5.6	276
900.3	863.42	64333	2.0	10.0	275	1.7	8.3	276	1.4	6.7	276	1.0	5.0	276
1057	1070.26	64433	1.6	8.1	276	1.4	6.7	276	1.1	5.4	276	0.8	4.0	276
1255	1204.40	66333	1.5	7.2	276	1.2	6.0	276	1.0	4.8	276	0.7	3.6	276
1450	1492.93	66433	1.2	5.8	276	1.0	4.8	276	0.8	3.9	276	0.6	2.9	276
1785	1786.58	66623	1.0	4.9	280	0.8	4.1	280	0.7	3.3	280	0.5	2.5	280

Torque shown in 1,000 lb•in

## TITAN RATINGS

Nominal Ratio	TITAN		1750			1450			1170			870		
	Exact Ratio	Gear Code	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE
11.02	11.02	00033	158.8	665	251	131.6	582	265	106.2	502	283	79.0	407	309
13.85	13.66	00043	128.1	556	260	106.2	487	275	85.7	409	286	63.7	341	321
17.21														
20.41	19.05	00063	91.9	422	275	76.1	370	291	61.4	319	311	45.7	258	339
24.00	24.60	00083	71.1	346	291	58.9	302	307	47.6	260	328	35.4	212	359
31.63	31.37	00233	55.8	328	343	46.2	280	363	37.3	247	387	27.7	201	423
36.56	36.57	00333	47.9	294	359	39.7	258	380	32.0	222	405	23.8	180	443
43.78	45.33	00433	38.6	253	383	32.0	222	405	25.8	191	432	19.2	155	472
54.45	56.18	00443	31.1	212	398	25.8	186	420	20.8	160	449	15.5	126	477
64.42	63.23	00633	27.7	200	423	22.9	176	448	18.5	151	477	13.8	113	478
69.63														
80.01	78.37	00643	22.3	168	440	18.5	148	466	14.9	122	477	11.1	90.8	478
91.41														
99.38	104.12	03233	16.8	141	477	13.9	117	478	11.2	94.3	478	8.4	70.3	479
111.5	109.32	00663	16.0	124	454	13.3	109	478	10.7	87.6	478	8.0	65.3	479
121.4	121.37	03333	14.4	121	478	11.9	100	478	9.6	80.9	478	7.2	60.3	479
138.5	129.06	04233	13.6	114	478	11.2	94.3	478	9.1	76.1	478	6.7	56.7	479
159.8	150.44	04333	11.6	97.6	478	9.6	80.9	478	7.8	65.4	479	5.8	48.6	479
174.8	180.03	06233	9.7	81.6	478	8.1	67.7	479	6.5	54.7	479	4.8	40.6	479
193.1	186.48	04433	9.4	78.8	478	7.8	65.4	479	6.3	52.8	479	4.7	39.2	479
206.2	209.86	06333	8.3	70.1	479	6.9	58.1	479	5.6	46.9	479	4.1	34.9	479
238.2	231.16	04443	7.6	63.7	479	6.3	52.8	479	5.1	42.6	479	3.8	31.7	479
265.4	260.13	06433	6.7	56.6	479	5.6	46.9	479	4.5	37.8	479	3.3	28.1	479
295.7	280.59	04733	6.2	52.5	479	5.2	43.5	479	4.2	35.1	479	3.1	26.1	479
330.1	322.45	06443	5.4	45.6	479	4.5	37.8	479	3.6	30.5	479	2.7	22.7	479
369.8	362.87	06633	4.8	40.6	479	4.0	33.6	479	3.2	27.1	479	2.4	20.2	480
412.1	391.40	06733	4.5	37.6	479	3.7	31.2	479	3.0	25.1	479	2.2	18.7	480
459.0	449.79	06643	3.9	32.7	479	3.2	27.1	479	2.6	21.9	479	1.9	16.3	480
532.5	531.01	44233	3.3	28.4	479	2.7	23.6	479	2.2	19.0	480	1.6	14.2	480
617.9	627.43	06663	2.8	23.5	479	2.3	19.5	480	1.9	15.7	480	1.4	11.7	480
660.6	676.77	06763	2.6	21.7	479	2.1	18.1	480	1.7	14.6	480	1.3	10.8	480
741.2	767.25	44433	2.3	19.2	480	1.9	16.3	480	1.5	13.2	480	1.1	9.8	480
900.3	863.42	64333	2.0	17.5	480	1.7	14.5	480	1.4	11.7	480	1.0	8.7	480
1057	1070.26	64433	1.6	14.1	480	1.4	11.7	480	1.1	9.4	480	0.8	7.0	480
1255	1204.40	66333	1.5	12.6	480	1.2	10.4	480	1.0	8.4	480	0.7	6.2	480
1450	1492.93	66433	1.2	10.1	480	1.0	8.4	480	0.8	6.8	480	0.6	5.0	480
1785	1850.58	66443	0.9	8.2	480	0.8	6.8	480	0.6	5.5	480	0.5	4.1	480

Torque shown in 1,000 lb•in

## JUPITER RATINGS

Nominal Ratio	Jupiter		1750			1450			1170			870		
	Exact Ratio	Gear Code	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE
	11.02													
13.85	12.80	00034	136.7	1088	477	113.3	953	504	91.4	821	538	68.0	667	588
17.21	15.87	00044	110.3	898	488	91.4	788	517	73.7	678	551	54.8	551	602
20.41	22.14	00064	79.1	683	518	65.5	599	548	52.9	515	584	39.3	419	638
24.00														
31.63														
36.56														
43.78	42.49	00334	41.2	482	683	34.1	422	722	27.5	363	771	20.5	289	824
54.45	52.67	00344	33.2	398	700	27.5	349	741	22.2	300	789	16.5	233	825
64.42	60.92	00354	28.7	355	722	23.8	311	764	19.2	268	816	14.3	202	826
69.63	65.29	00444	26.8	343	747	22.2	300	789	17.9	253	825	13.3	188	826
80.01	75.52	00454	23.2	306	772	19.2	268	816	15.5	219	826	11.5	163	827
91.41	91.08	00644	19.2	271	825	15.9	225	825	12.8	182	826	9.55	135	827
99.38														
111.5	105.34	00654	16.6	235	825	13.8	195	826	11.1	157	827	8.26	117.1	828
121.4	127.05	00664	13.8	195	826	11.4	162	827	9.21	130	827	6.85	97.1	828
138.5	136.04	00854	12.9	182	826	10.7	151	827	8.60	122	827	6.40	90.6	828
159.8	149.98	02434	11.7	169	827	9.67	140	827	7.80	113	828	5.80	84.3	828
174.8	174.83	04334	10.0	145	827	8.29	121	828	6.69	97.3	828	4.98	72.4	829
193.1	202.21	03354	8.7	126	827	7.17	104	828	5.79	84.1	828	4.30	62.6	829
206.2	216.71	04434	8.1	117	828	6.69	97.3	828	5.40	78.6	829	4.01	58.4	829
238.2	260.13	06334	6.7	97.8	828	5.57	81.0	828	4.50	65.5	829	3.34	48.7	829
265.4	268.63	04444	6.5	94.7	828	5.40	78.6	829	4.36	63.4	829	3.24	47.1	829
295.7	302.30	06434	5.8	84.2	828	4.80	69.8	829	3.87	56.3	829	2.88	41.9	829
330.1	326.07	07434	5.4	78.1	829	4.45	64.7	829	3.59	52.2	829	2.67	38.8	829
369.8	374.71	06444	4.7	68.0	829	3.87	56.3	829	3.12	45.4	829	2.32	33.8	829
412.1	404.18	07444	4.3	63.0	829	3.59	52.2	829	2.89	42.1	829	2.15	31.3	829
459.0	454.84	07634	3.8	56.0	829	3.19	46.4	829	2.57	37.4	829	1.91	27.8	829
532.5	522.70	06644	3.3	48.7	829	2.77	40.4	829	2.24	32.6	829	1.66	24.2	829
617.9	580.28	43334	3.0	45.0	829	2.50	37.3	829	2.02	30.1	829	1.50	22.4	830
660.6	652.10	07654	2.7	39.1	829	2.22	32.4	829	1.79	26.1	829	1.33	19.4	830
741.2	729.13	06664	2.4	34.9	829	1.99	28.9	829	1.60	23.4	829	1.19	17.4	830
900.3	891.61	44434	2.0	29.3	829	1.63	24.3	829	1.31	19.6	830	0.98	14.6	830
1057	1031.25	44354	1.7	25.3	829	1.41	21.0	830	1.13	17.0	830	0.84	12.6	830
1255	1243.73	64434	1.4	21.0	830	1.17	17.4	830	0.94	14.1	830	0.70	10.5	830
1450	1438.51	64354	1.2	18.2	830	1.01	15.1	830	0.81	12.2	830	0.60	9.0	830
1785	1734.92	66434	1.0	15.1	830	0.84	12.5	830	0.67	10.1	830	0.50	7.5	830

Torque shown in 1,000 lb•in

## GEMINI RATINGS

Nominal Ratio	Gemini		1750			1450			1170			870		
	Exact Ratio	Gear Code	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE
	11.02	11.84	00034	147.8	1968	798	122.5	1770	866	98.8	1522	923	73.5	1237
13.85	14.68	00044	119.2	1650	829	98.8	1482	899	79.7	1276	959	59.3	1037	1,048
17.21														
20.41														
24.00														
31.63														
36.56	39.30	00334	44.5	665	872	36.9	582	922	29.8	501	984	22.1	407	1,075
43.78	48.72	00344	35.9	665	1,081	29.8	597	1,172	24.0	501	1,219	17.9	396	1,297
54.45														
64.42	60.39	00444	29.0	556	1,121	24.0	487	1,186	19.4	420	1,266	14.4	341	1,383
69.63	67.96	00634	25.8	422	958	21.3	370	1,013	17.2	318	1,080	12.8	259	1,181
80.01	84.24	00644	20.8	422	1,187	17.2	370	1,256	13.9	318	1,339	10.3	259	1,464
91.41	87.76	00834	19.9	345	1,011	16.5	303	1,070	13.3	260	1,141	9.9	212	1,247
99.38														
111.5	108.79	00844	16.1	345	1,253	13.3	303	1,326	10.8	260	1,414	8.0	212	1,545
121.4	130.45	03334	13.4	294	1,249	11.1	256	1,310	9.0	222	1,410	6.7	180	1,541
138.5	138.72	02344	12.6	328	1,479	10.5	287	1,565	8.4	247	1,669	6.3	189	1,713
159.8	161.70	03344	10.8	294	1,549	9.0	258	1,638	7.2	217	1,707	5.4	162	1,719
174.8	171.96	02444	10.2	274	1,535	8.4	240	1,624	6.8	204	1,710	5.1	153	1,721
193.1	193.51	02634	9.0	208	1,311	7.5	182	1,387	6.0	150	1,414	4.5	112	1,420
206.2	200.44	04344	8.7	250	1,630	7.2	217	1,707	5.8	176	1,716	4.3	131	1,725
238.2	225.57	06334	7.8	201	1,472	6.4	176	1,558	5.2	151	1,661	3.9	119	1,750
265.4	248.46	04444	7.0	199	1,608	5.8	176	1,716	4.7	142	1,723	3.5	106	1,731
295.7	301.59	07344	5.8	172	1,691	4.8	145	1,722	3.9	118	1,728	2.9	87.9	1,735
330.1	346.58	06444	5.0	150	1,693	4.2	127	1,726	3.4	103	1,731	2.5	76.6	1,737
369.8	373.84	07444	4.7	139	1,695	3.9	118	1,728	3.1	95.2	1,733	2.3	71.0	1,738
412.1	432.99	33334	4.0	127	1,750	3.3	106	1,752	2.7	85.3	1,754	2.0	63.5	1,756
459	460.44	42334	3.8	120	1,751	3.1	99.4	1,752	2.5	80.3	1,754	1.9	59.7	1,756
532.5	536.72	43334	3.3	103	1,752	2.7	85.3	1,754	2.2	68.9	1,755	1.6	51.3	1,757
617.9	570.75	42434	3.1	96.7	1,752	2.5	80.2	1,754	2.0	64.8	1,756	1.5	48.3	1,758
660.6	642.29	62334	2.7	86.1	1,754	2.3	71.3	1,755	1.8	57.6	1,757	1.4	42.9	1,758
741.2	748.68	63334	2.3	73.9	1,755	1.9	61.2	1,756	1.6	49.4	1,757	1.2	36.8	1,759
900.3	824.67	44434	2.1	67.1	1,756	1.8	55.6	1,757	1.4	44.9	1,758	1.1	33.4	1,759
1057	1001.02	47334	1.7	55.3	1,757	1.4	45.9	1,758	1.2	37.0	1,759	0.9	27.5	1,760
1255	1150.36	64434	1.5	48.2	1,758	1.3	39.9	1,758	1.0	32.2	1,759	0.8	24.0	1,760
1450	1396.36	67334	1.3	39.7	1,758	1.0	32.9	1,759	0.8	26.6	1,760	0.6	19.7	1,760
1785	1730.87	67434	1.0	32.0	1,759	0.8	26.6	1,760	0.7	21.4	1,760	0.5	15.9	1,761

Torque shown in 1,000 lb•in

# HERCULES RATINGS

Nominal Ratio	Hercules		1750			1450			1170			870		
	Exact Ratio	Gear Code	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE	RPM OUT	HP	TORQUE
11.02														
13.85														
17.21														
20.41														
24.00														
31.63														
36.56														
43.78	47.80	00344	36.6	1115	1,779	30.3	978	1,883	24.5	841	2,008	18.2	684	2,195
54.45	59.25	00444	29.5	922	1,823	24.5	808	1,928	19.7	695	2,057	14.7	565	2,248
64.42	68.52	00544	25.5	823	1,883	21.2	722	1,992	17.1	621	2,125	12.7	505	2,322
69.63	71.21	00454	24.6	884	2,101	20.4	775	2,223	16.4	658	2,339	12.2	492	2,354
80.01	82.37	00554	21.2	798	2,195	17.6	700	2,323	14.2	571	2,347	10.6	427	2,361
91.41	88.15	00464	19.9	615	1,809	16.4	513	1,821	13.3	416	1,832	9.87	312	1,844
99.38	99.34	00654	17.6	700	2,322	14.6	586	2,346	11.8	475	2,356	8.76	355	2,367
111.5	106.59	00564	16.4	512	1,821	13.6	426	1,831	11.0	346	1,840	8.16	258	1,850
121.4	128.56	00664	13.6	427	1,831	11.3	355	1,840	9.10	288	1,847	6.77	215	1,856
138.5														
159.8	158.64	03344	11.0	494	2,550	9.14	433	2,698	7.38	373	2,878	5.48	280	2,909
174.8														
193.1	196.65	04344	8.9	425	2,720	7.37	373	2,878	5.95	313	2,992	4.42	233	2,995
206.2	227.44	03544	7.7	364	2,698	6.38	320	2,855	5.14	270	2,994	3.83	201	2,995
238.2	243.75	04444	7.2	351	2,786	5.95	308	2,948	4.80	252	2,994	3.57	188	2,995
265.4	274.31	06344	6.4	335	2,992	5.29	278	2,994	4.27	224	2,995	3.17	167	2,996
295.7	281.93	04544	6.2	326	2,992	5.14	270	2,994	4.15	218	2,995	3.09	162	2,996
330.1	340.02	06444	5.1	271	2,994	4.26	224	2,995	3.44	181	2,996	2.56	135	2,996
369.8	354.25	08344	4.9	260	2,994	4.09	215	2,995	3.30	174	2,996	2.46	129	2,997
412.1	439.12	08444	4.0	210	2,995	3.30	174	2,996	2.66	140	2,996	1.98	104	2,997
459.0	474.30	06644	3.7	194	2,995	3.06	161	2,996	2.47	130	2,997	1.83	96.5	2,997
532.5	507.88	08544	3.4	181	2,996	2.85	150	2,997	2.30	121	2,997	1.71	90.1	2,997
617.9	612.53	08644	2.9	150	2,996	2.37	125	2,997	1.91	101	2,997	1.42	74.8	2,999
660.6	652.70	43344	2.7	145	2,996	2.22	120	2,997	1.79	96.7	2,997	1.33	72.0	2,999
741.2	754.91	33544	2.3	125	2,997	1.92	104	2,997	1.55	83.6	2,997	1.15	62.2	2,999
900.3	910.46	63344	1.9	104	2,997	1.59	86.0	2,997	1.29	69.4	2,999	0.96	51.6	2,999
1057	1044.33	27444	1.7	90.4	2,997	1.39	75.0	2,999	1.12	60.5	2,999	0.83	45.0	2,999
1255	1217.33	74344	1.4	77.6	2,998	1.19	64.3	2,999	0.96	51.9	2,999	0.71	38.6	2,999
1450	1407.97	73544	1.2	67.1	2,999	1.03	55.6	2,999	0.83	44.9	2,999	0.62	33.4	2,999
1785	1698.08	76344	1.0	55.7	2,999	0.85	46.1	2,999	0.69	37.2	2,999	0.51	27.7	3,000

Torque shown in 1,000 lb•in

**TABLE 3 - THERMAL HP LIMITS**

1750 RPM											1450 RPM										
Ratio	Orion		Titan		Jupiter		Gemini		Hercules		Ratio	Orion		Titan		Jupiter		Gemini		Hercules	
	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan		Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan
11.02	0	130	0	0			0	0			11.02	0	165	0	48			0	50		
13.85	0	161	18	107	18	66	20	75			13.85	28	210	25	219	18	245	27	279		
17.21					21	79					17.21					21	294				
20.41	18	175	39	329	28	312					20.41	35	218	60	310	53	413				
24.00			39	361							24.00	42	232	60	370						
31.63	18	105	28	140							31.63	21	104	42	154						
36.56	18	95	28	140			30	150			36.56	28	109	46	154			42	225		
43.78	25	102	39	144	14	182	31	199	0	215	43.78	35	112	53	165	42	214	29	236	0	258
54.45	28	102	49	158	28	182			16	297	54.45	39	115	63	211	46	214			79	363
64.42	25	98	42	151	60	224	63	288	70	351	64.42	35	116	60	209	60	249	79	328	123	407
69.63	32	105			67	235	59	279	43	324	69.63	42	116			60	234	72	309	101	385
80.01	32	106	49	216	70	235	82	313	110	391	80.01	42	117	74	216	88	278	108	359	156	440
91.41	32	108			98	284	89	317	69	350	91.41	43	119			112	300	115	353	123	406
99.38	35	108	49	217					75	360	99.38	42	118	77	217					130	459
111.5	32	106	70	218	105	296	113	355	132	413	111.5	42	118	81	219	119	311	136	385	175	459
121.4	44	99	53	217	109	290	128	372	174	455	121.4	46	105	60	218	123	306	149	389	209	473
138.5	35	108	74	220	88	298	88	402			138.5	44	118	106	220	143	313	161	370		
159.8			29		40		15	250	17	350	159.8			64		45		21		22	390

1170 RPM											870 RPM										
Ratio	Orion		Titan		Jupiter		Gemini		Hercules		Ratio	Orion		Titan		Jupiter		Gemini		Hercules	
	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan		Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan	Without Fan	With Fan
11.02	35	238	35	266			37	319			11.02	56	241	49	351			51	439		
13.85	46	246	49	343	21	357	50	407			13.85	74	246	98	409	70	497	80	567		
17.21					25	428					17.21					84	596				
20.41	53	251	98	417	81	537					20.41	102	251	147	463	147	675				
24.00			98	440							24.00			147	480						
31.63	28	109	70	484							31.63	52	128	88	497						
36.56	42	120	70	172			32	254			36.56	53	120	77	191			71	285		
43.78	46	123	70	180	67	238	62	288	52	339	43.78	56	123	81	197	105	270	114	348	136	426
54.45	46	124	74	188	70	252			137	424	54.45	57	124	88	202	98	284			200	489
64.42	46	125	70	183	74	284	103	372	173	460	64.42	58	125	84	200	119	308	151	412	226	516
69.63	49	125			74	260	98	350	155	442	69.63	58	125			123	291	150	396	213	502
80.01	49	126	84	195	105	291	133	350	200	486	80.01	59	126	96	209	138	317	170	426	246	536
91.41	50	129			123	314	137	350	172	459	91.41	60	129			151	331	174	423	226	515
99.38	51	127	87	197					180	499	99.38	60	127	97	210					230	520
111.5	50	126	90	201	144	323	165	350	215	501	111.5	59	126	99	212	158	337	187	442	257	547
121.4	53	126	63	201	140	321	171	350	242	529	121.4	60	127	69	211	155	334	192	451	278	567
138.5							24				138.5	60	127	101	214	159	338	207	338		
159.8					90		27		70		159.8					130		71		148	

\* Consult Factory for heat exchanger selection.

**TABLE 4 - AMBIENT TEMPERATURE ADJUSTMENT FACTOR (Ac)**

Ambient Temperature (°F)	Percent of Operational Time Per Hour		
	100%	75%	50%
below 54	1.20	1.27	1.40
55 to 69	1.10	1.17	1.29
70 to 84	1.00	1.06	1.17
85 to 99	0.85	0.90	0.99
100 to 114	0.70	0.74	0.81
above 115	Consult Factory		



**TABLE 5 - OVERHUNG LOAD CAPACITY**

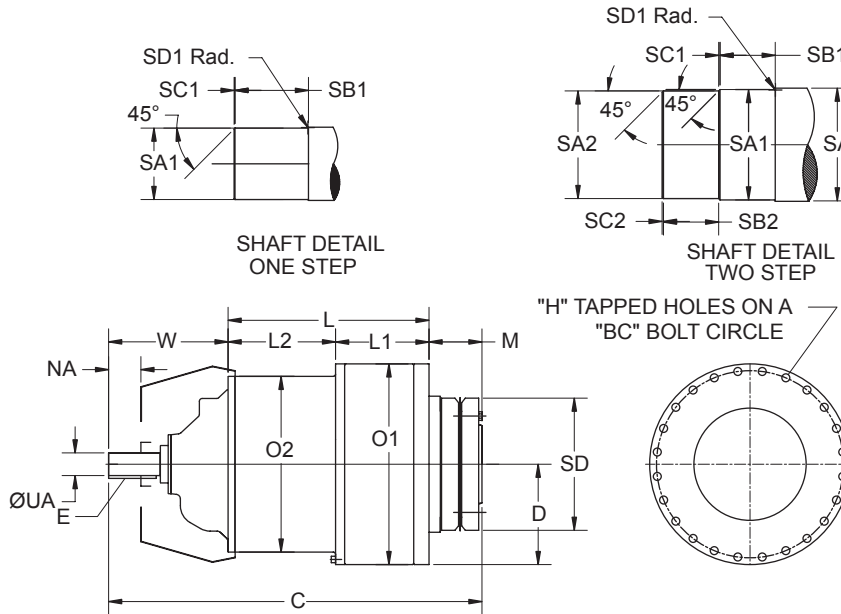
Distance in Inches‡	Load Location Factor (L1) - High Speed Shaft			
	Orion (qu) Titan (qu)	Orion Orion (q)	Titan Titan (q) Jupiter Jupiter (q) Jupiter (qu) Gemini Gemini (q) Gemini (qu)	Hercules Hercules (q) Hercules (qu)
3/4	0.80	0.73	0.70	0.73
1	0.85	0.78	0.74	0.76
1 1/4	0.89	0.82	0.79	0.79
1 1/2	0.93	0.87	0.83	0.82
1 3/4	0.98	0.92	0.87	0.85
2	1.02	0.97	0.91	0.88
2 1/4	1.07	1.03	0.96	0.91
2 1/2	1.11	1.08	1.00	0.94
2 3/4	1.15	1.13	1.04	0.97
3	1.2	1.18	1.09	1.00
3 1/4	1.25	1.23	1.13	1.03
3 1/2	1.31	1.28	1.17	1.06
3 3/4	1.38	1.33	1.21	1.09
4	1.44	1.38	1.26	1.12
4 1/4	1.50	1.43	1.31	1.15
4 1/2		1.49	1.37	1.18
4 3/4			1.42	1.21
5			1.47	1.24
5 1/2			1.58	1.30
6				1.36
6 1/2				1.42

H.S. Shaft RPM ‡	Overhung Load Capacity (lbf) - High Speed Shaft			
	Orion (qu) Titan (qu)	Orion Orion (q)	Titan Titan (q) Jupiter Jupiter (q) Jupiter (qu) Gemini Gemini (q) Gemini (qu)	Hercules Hercules (q) Hercules (qu)
1750	941	1,500	1,900	2,500
1430	999	1,600	2,040	2,660
1170	1,060	1,700	2,160	2,830
870	1,160	1,860	2,360	3,100
720	1,230	1,960	2,500	3,270
580	1,310	2,100	2,670	3,490

SMP High Overhung Load LLF (L1) High Speed Shaft (d, t, q)		
Distance in Inches	Orion Factor	Titan Jupiter Gemini Factor
0.25		0.77
0.5		0.80
0.75	0.81	0.82
1	0.85	0.85
1.25	0.89	0.88
1.5	0.93	0.90
1.75	0.97	0.92
2	1.01	0.95
2.25	1.04	0.97
2.5	1.08	1.00
2.75	1.12	1.02
3	1.16	1.05
3.25	1.20	1.07
3.5	1.24	1.10
3.75	1.27	1.12
4	1.31	1.15
4.25	1.35	1.17
4.5	1.39	1.20
4.75	1.43	1.22
5	1.47	1.25
5.25	1.54	1.28
5.5	1.62	1.30
5.75	1.70	1.32
6	1.78	1.35
6.5	1.85	1.40
7		1.45
7.5		1.50
8		1.55
8.5		1.60
9		1.65

SMP High Overhung Load Capacity (lbf) High Speed Shaft		
1750	3560	5510
1430	3790	5860
1170	4020	6220
870	4400	6800
720	4650	7200
580	4950	7670

## SHAFT MOUNT FLANGE B.C., ONE AND TWO-STEP SHAFT DIMENSIONS



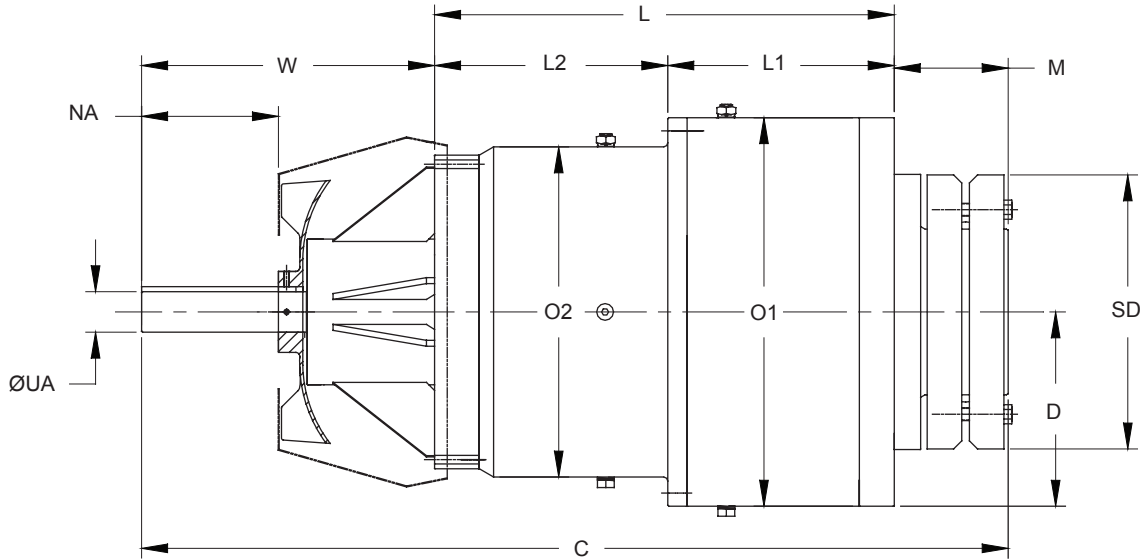
Series	SA (Ø)	SA1 (Ø)	SB1	SC1	SD1	SA2 (Ø)	SB2	SC2	SD2	H	B.C. (Ø)	M
Orion	-	5.315	6.102	0.11	0.06	-	-	-	11.811	(24) M16	17.250	4.650
Titan	-	6.299	7.480	0.12	0.06	-	-	-	14.567	(24) M20	20.625	5.17
Jupiter	8.268	7.874	3.937	0.098	0.06	7.677	3.937	0.098	16.929	(32) M20	22.375	7.02
Gemini	10.236	9.843	4.724	0.098	0.06	9.646	4.724	0.098	20.472	(32) M24	26.125	8.67
Hercules	12.21	11.811	5.021	0.098	0.06	11.614	5.021	0.098	25.391	(32) M24	33.375	9.34

Series	NA				UA		E	
	w/o fan		w/ fan		d, t, q	quint	d, t, q	quint
	d, t, q	quint	d, t, q	quint				
Orion	4.50	4.25	3.25	2.88	2.125	1.875	1/2 x 1/2 x 4	1/2 x 1/2 x 3 3/4
Titan	5.68	4.25	3.56	2.88	2.500	1.875	5/8x 5/8 x 5 1/8	1/2 x 1/2 x 3 3/4
Jupiter	6.50	5.68	4.11	3.56	2.500	2.500	5/8x 5/8 x 6	5/8x 5/8 x 5 1/8
Gemini	6.50	5.68	4.11	3.56	2.500	2.500	5/8x 5/8 x 6	5/8x 5/8 x 5 1/8
Hercules	6.50	6.50	4.38	4.38	3.000	3.000	3/4 x 3/4 x 5 7/8	3/4 x 3/4 x 5 7/8

Series	C		D	L		L2		L1		O1	O2	W	
	d, t, q	quint		d, t, q	quint	d, t, q	quint	d, t, q	quint			d, t, q	quint
Orion	33.36	34.98	9.19	17.27	17.33	8.64	8.70	8.63	8.63	18.38	14.37	11.44	13.00
Titan	40.49	39.88	11.06	22.16	21.91	11.86	11.61	10.30	10.30	22.13	19.37	13.16	12.80
Jupiter	47.30	49.93	12.00	26.30	29.75	12.36	15.81	13.94	13.94	24.00	20.40	13.98	13.16
Gemini	53.38	56.01	13.88	30.73	34.18	12.36	15.81	18.37	18.37	27.75	20.40	13.98	13.16
Hercules	65.75	65.75	17.75	42.16	42.16	23.20	23.20	18.96	18.96	35.50	26.75	14.25	14.25

NOTE: Dimensions subject to change. Certified dimensions of ordered material furnished upon request.

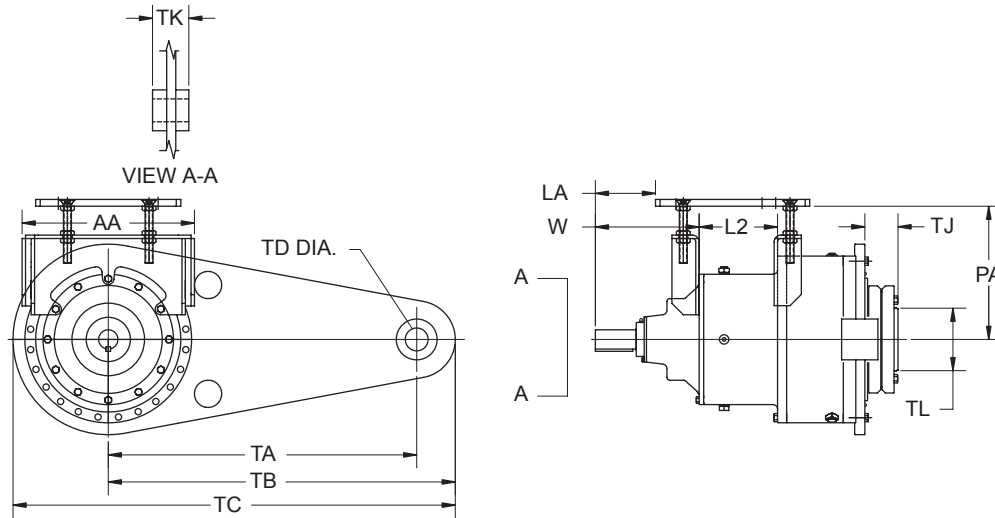
## SHAFT MOUNT FLANGE B.C., ONE AND TWO-STEP SHAFT DIMENSIONS HEAVY DUTY



Series	SA (Ø)	SA1 (Ø)	SB1	SC1	SD1	SA2 (Ø)	SB2	SC2	SD	H	B.C. (Ø)	M
Orion	-	5.315	6.102	0.11	0.06	-	-	-	11.811	(24) M16	17.250	4.650
Titan	-	6.299	7.480	0.12	0.06	-	-	-	13.00	(24) M20	20.625	5.17
Jupiter	8.268	7.874	3.937	0.098	0.06	7.677	3.937	0.098	16.929	(32) M20	22.375	7.02
Gemini	10.236	9.843	4.724	0.098	0.06	9.646	4.724	0.098	20.472	(32) M24	26.125	8.67

Series	NA		UA	W	E	C	D	L	L2	L1	O1	O2
	w/o fan	w/fan										
Orion	7.93	5.06	2.13	13.88	1/2 x 1/2 x 4	37.05	9.19	18.52	9.89	8.63	18.38	14.37
Titan	9.19	7.43	2.500	17.04	5/8 x 5/8 x 8 1/2	46.37	11.06	24.16	13.86	10.30	22.13	19.37
Jupiter	10.19	8.43	2.500	18.04	5/8 x 5/8 x 9 1/2	53.36	12.00	28.30	14.36	13.94	24.00	20.40
Gemini	10.19	8.43	2.500	18.04	5/8 x 5/8 x 9 1/2	59.44	13.88	32.73	14.36	18.37	27.75	20.40

# SHAFT MOUNT TOP MOTOR MOUNT & TORQUE ARM DIMENSIONS



Series	AA	C		L2		LA		PA		W		TA	TB	TC
		d, t, q	quint	s, d, t	quint	d, t, q	quint	min.	max.	d, t, q	quint			
Orion	19.00	33.36	34.98	8.64	8.70	6.69	8.19	13.35	16.53	11.44	13.00	34.00	38.25	48.75
Titan	22.25	40.49	39.88	11.86	11.61	7.66	7.06	16.72	20.52	13.16	12.80	34.00	38.25	49.56
Jupiter	27.25	47.30	49.93	12.36	15.81	7.95	7.95	16.85	20.52	13.98	13.16	43.31	48.31	64.31
Gemini	22.25	53.38	56.01	12.36	15.81	7.50	7.88	16.75	20.50	13.98	13.16	59.06	65.31	81.31
Hercules	30.00	65.75	65.75	23.20	23.20	10.25	10.25	19.19	22.63	14.25	14.25	72.83	80.34	98.08

Series	TG	TF	TK	TE (Ø)	TD (Ø)	TJ	TH	TL (Ø)
Orion	6.00	11.00	4.00	3.00	2.5197	3.65	2.22	6.8898
Titan	6.50	12.00	4.00	3.00	2.520	4.17	2.669	7.284
Jupiter	8.25	12.50	4.3307	3.00	5.020	6.141	4.415	10.236
Gemini	8.875	13.50	4.00	3.00	6.375	7.2912	6.0412	12.598
Hercules	12.375	15.25	4.00	3.00	7.188	7.466	6.466	14.9606

Motor Frame Size									
Orion	Titan	Jupiter	Gemini	Hercules	Orion HD	Titan HD	Jupiter HD	Gemini HD	Hercules HD
213T/215T	213T/215T	213T/215T	213T/215T	213T/215T	213T/215T	213T/215T	213T/215T	213T/215T	213T/215T
254T/256T	254T/256T	254T/256T	254T/256T	254T/256T	254T/256T	254T/256T	254T/256T	254T/256T	254T/256T
284T/286T	284T/286T	284T/286T	284T/286T	284T/286T	284T/286T	284T/286T	284T/286T	284T/286T	284T/286T
324T/326T	324T/326T	324T/326T	324T/326T	324T/326T	324T/326T	324T/326T	324T/326T	324T/326T	324T/326T
364T/365T	364T/365T	364T/365T	364T/365T	364T/365T	364T/365T	364T/365T	364T/365T	364T/365T	364T/365T
404T/405T	404T/405T	404T/405T	404T/405T	404T/405T	404T/405T	404T/405T	404T/405T	404T/405T	404T/405T
444T/445T	444T/445T	444T/445T	444T/445T	444T/445T	444T/445T	444T/445T	444T/445T	444T/445T	444T/445T

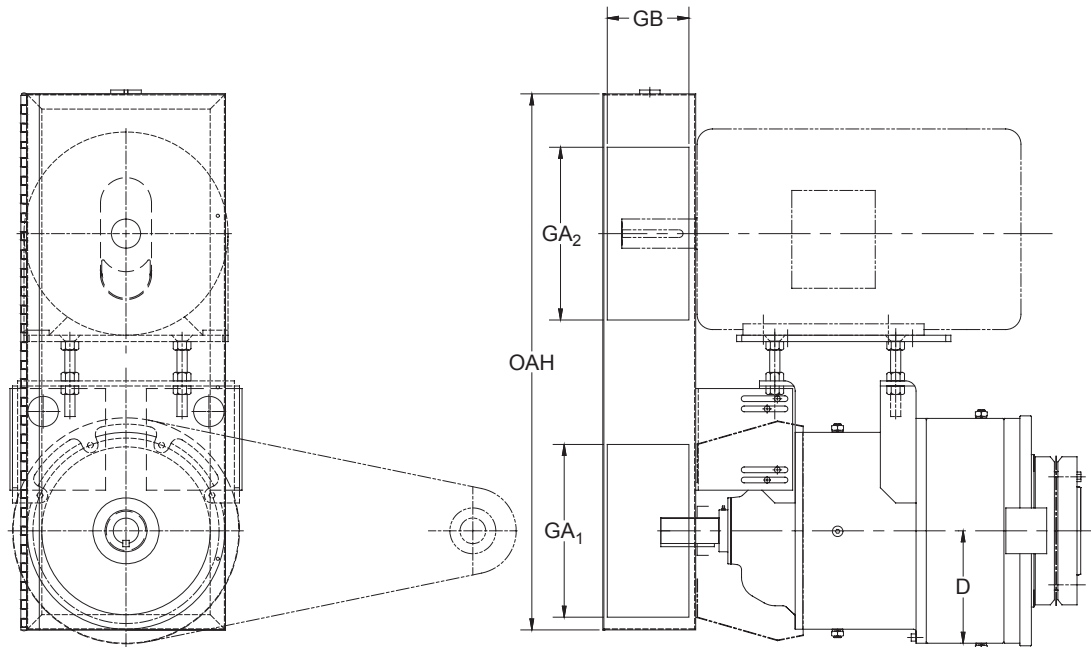
Series HEAVY DUTY d,t,quad	AA	C		L2	LA	PA		W	TA	TB
		d, t, q	s, d, t	d, t, q	min.	max.	d, t, q			
Orion	19.00	37.05	9.89	9.56	13.35	16.53	13.88	34.00	38.25	
Titan	22.25	46.37	13.86	13.53	16.72	20.52	17.04	34.00	38.25	
Jupiter	23.75	53.36	14.36	13.04	16.85	20.52	18.04	43.31	48.31	
Gemini	23.75	59.44	14.36	10.75	16.75	20.50	18.04	59.06	65.31	

Series HEAVY DUTY d,t,quad	TC	TG	TF	TK	TE (Ø)	TD (Ø)	TJ	TH	TL (Ø)
Orion	48.75	6.00	11.00	4.00	3.00	2.5197	3.65	2.22	6.8898
Titan	49.56	6.50	12.00	4.00	3.00	2.520	4.17	2.669	7.284
Jupiter	64.31	8.25	12.50	4.3307	3.00	5.020	6.141	4.415	10.236
Gemini	81.31	8.875	13.50	4.00	3.00	6.375	7.2912	6.0412	12.5980

d = double reduction, t = triple reduction, q = quadruple reduction      \* TOLERANCES: 3.000" Diameter or less +.000/-0.01  
<sup>2</sup> Contact factory for motor frame sizes other than "T" frame motors      \*\* Heavy Duty

**NOTE: Dimensions subject to change. Certified dimensions of ordered material furnished upon request.**

## SHAFT MOUNT BELT GUARDS



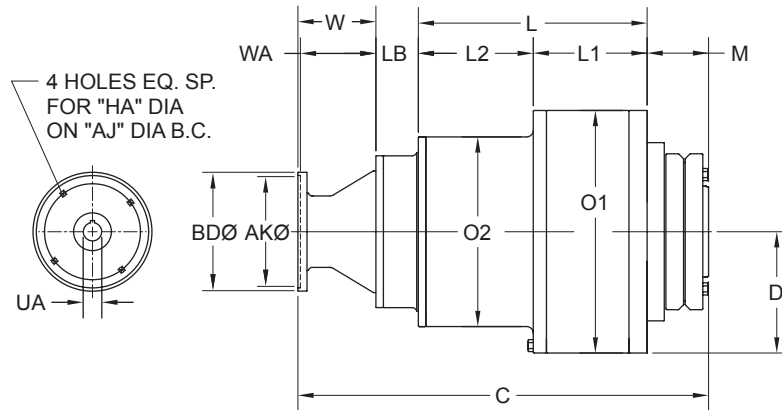
Series	D	GA1	GA2	GB	OAH	Motor Size Range
	Base to Centerline	Max Sheave Ø Reducer	Max Sheave Ø Motor	Max Sheave Width	Overall Height	
Orion	9.19	15.00	15.00	8.00	43.50	215T-286T
					50.25	324T-405T
Titan	11.06	17.00	17.00	8.00	48.00	215T-286T
					53.75	324T-445T
Jupiter	12.00	17.00	17.00	8.00	48.00	215T-286T
					53.75	324T-445T
Gemini	13.88	17.00	17.00	8.00	48.00	215T-286T
					53.75	324T-445T
Hercules	17.75	19.50	19.50	8.00	53.38	215T-286T
					57.50	324T-445T

Series HEAVY DUTY	D	GA1	GA2	GB	OAH	Motor Size Range
	Base to Centerline	Max Sheave Ø Reducer	Max Sheave Ø Motor	Max Sheave Width	Overall Height	
Orion	9.19	15.00	15.00	8.00	43.50	215T-286T
					50.25	324T-405T
Titan	11.06	17.00	17.00	8.00	48.00	215T-286T
					53.75	324T-445T
Jupiter	12.00	17.00	17.00	8.00	48.00	215T-286T
					53.75	324T-445T
Gemini	13.88	17.00	17.00	8.00	53.38	215T-286T
					57.50	324T-445T
Hercules	13.88	19.50	19.50	8.00	53.38	215T-286T
					57.50	324T-445T

Guards based on synchronous belt with ratio not to exceed 2.5:1.

**NOTE: Dimensions subject to change. Certified dimensions of ordered material furnished upon request.**

## SHAFT MOUNT INTEGRAL DIMENSIONS



Series	Frame Size	HA (Ø)	AJ (Ø)	UA	BD (Ø)	AK (Ø)	W	WA	L	L2	L1	M	C	D	LB	O1	O2
Orion (d,t,q)	143TC-145TC	0.38	5.875	0.875	6.63	4.50	4.86	4.67	17.33	8.70	8.63	4.650	30.06	9.19	3.22	18.38	14.37
	182TC-184TC	0.5	7.250	1.125	9.00	8.50	5.91	5.72	17.33	8.70	8.63	4.650	31.11	9.19	3.22	18.38	14.37
	213TC-215TC	0.5	7.250	1.375	9.00	8.50	5.91	5.72	17.33	8.70	8.63	4.650	31.11	9.19	3.22	18.38	14.37
	254TC-256TC	0.5	7.250	1.625	9.00	8.50	5.91	5.72	17.33	8.70	8.63	4.650	31.11	9.19	3.22	18.38	14.37
	284TC-286TC	0.5	9.000	1.875	11.00	10.50	6.06	5.87	17.33	8.70	8.63	4.650	31.26	9.19	3.22	18.38	14.37

Series	Frame Size	HA (Ø)	AJ (Ø)	UA	BD (Ø)	AK (Ø)	W	WA	L	L2	L1	M	C	D	LB	O1	O2
Orion (quint)	143TC-145TC	0.38	5.875	0.875	6.63	4.50	4.86	4.67	17.33	8.70	8.63	4.650	30.06	9.19	3.22	18.38	14.37
	182TC-184TC	0.5	7.250	1.125	9.00	8.50	5.91	5.72	17.33	8.70	8.63	4.650	31.11	9.19	3.22	18.38	14.37
	213TC-215TC	0.5	7.250	1.375	9.00	8.50	5.91	5.72	17.33	8.70	8.63	4.650	31.11	9.19	3.22	18.38	14.37
	254TC-256TC	0.5	7.250	1.625	9.00	8.50	5.91	5.72	17.33	8.70	8.63	4.650	31.11	9.19	3.22	18.38	14.37
	284TC-286TC	0.5	9.000	1.875	11.00	10.50	6.06	5.87	17.33	8.70	8.63	4.650	31.26	9.19	3.22	18.38	14.37

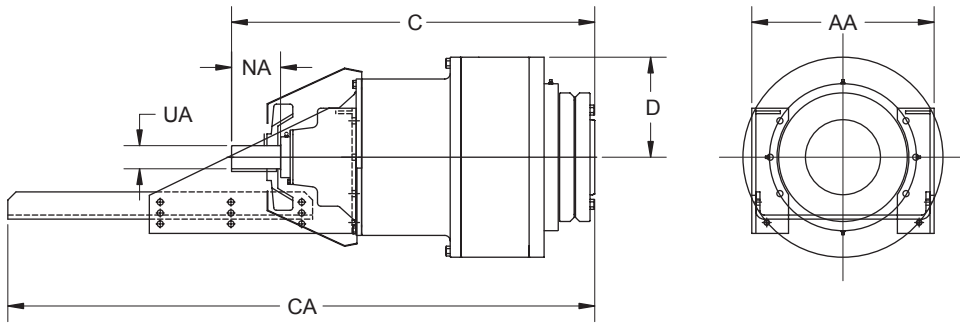
Series	Frame Size	HA (Ø)	AJ (Ø)	UA	BD (Ø)	AK (Ø)	W	WA	L	L2	L1	M	C	D	LB	O1	O2
Titan (quint)	143TC-145TC	0.38	5.875	0.875	6.63	4.50	4.86	4.67	21.91	11.61	10.30	5.17	34.96	11.06	3.02	22.13	19.37
	182TC-184TC	0.5	7.250	1.125	9.00	8.50	5.91	5.72	21.91	11.61	10.30	5.17	36.01	11.06	3.02	22.13	19.37
	213TC-215TC	0.5	7.250	1.375	9.00	8.50	5.91	5.72	21.91	11.61	10.30	5.17	36.01	11.06	3.02	22.13	19.37
	254TC-256TC	0.5	7.250	1.625	9.00	8.50	5.91	5.72	21.91	11.61	10.30	5.17	36.01	11.06	3.02	22.13	19.37
	284TC-286TC	0.5	9.000	1.875	11.00	10.50	6.06	5.87	21.91	11.61	10.30	5.17	36.16	11.06	3.02	22.13	19.37

Series	Frame Size	HA (Ø)	AJ (Ø)	UA	BD (Ø)	AK (Ø)	W	WA	L	L2	L1	M	C	D	LB	O1	O2
Titan (d,t,q)	143TC-145TC	0.38	5.875	0.875	6.63	4.50	4.86	4.67	21.91	11.61	10.30	5.17	34.96	11.06	3.02	22.13	19.37
	182TC-184TC	0.5	7.250	1.125	9.00	8.50	5.91	5.72	21.91	11.61	10.30	5.17	36.01	11.06	3.02	22.13	19.37
	213TC-215TC	0.5	7.250	1.375	9.00	8.50	5.91	5.72	21.91	11.61	10.30	5.17	36.01	11.06	3.02	22.13	19.37
	254TC-256TC	0.5	7.250	1.625	9.00	8.50	5.91	5.72	21.91	11.61	10.30	5.17	36.01	11.06	3.02	22.13	19.37
	284TC-286TC	0.5	9.000	1.875	11.00	10.50	6.06	5.87	21.91	11.61	10.30	5.17	36.16	11.06	3.02	22.13	19.37

\* Weights are calculated with no accessories

**NOTE: Dimensions subject to change. Certified dimensions of ordered material furnished upon request.**

# SHAFT MOUNT SCOOP DIMENSIONS



Series	Motor Range Size	C		CA		AA		D Base to Centerline
		d,t,q	quint	d,t,q	quint	d,t,q	quint	
Orion	143T-256T	33.36	34.98	53.92	55.14	16.75	15.25	9.19
	284T-326T	33.36	34.98	58.92	58.14	19.00	17.00	
Titan	143T-286T	40.49	39.88	63.33	60.03	23.00	15.25	11.06
	324T-326T	40.49	39.88	66.33	63.03	23.00	17.00	
Jupiter	143T-286T	47.30	49.93	72.82	72.76	27.25	23.00	12.00
	324T-326T	47.30	49.93	75.82	75.76	27.25	23.00	
Gemini	143T-286T	53.38	56.01	78.90	78.85	27.25	23.00	13.88
	324T-326T	53.38	56.01	81.90	81.85	27.25	23.00	
Hercules	143T-326T	65.75	65.75	91.00	91.00	27.25	27.25	17.75
	364T-365T	65.75	65.75	94.00	94.00	27.25	27.25	

Series	NA				UA*		Key		Avg. Wt. (lbs)
	w/o fan		w/ fan		d, t, q	quint	d, t, q	quint	
	d, t, q	quint	d, t, q	quint					
Orion	4.50	4.25	3.25	2.88	2.125	1.875	1/2 x 1/2 x 4	1/2 x 1/2 x 3 3/4	950
Titan	5.68	4.25	3.56	2.88	2.50	1.875	5/8 x 5/8 x 5 1/8	1/2 x 1/2 x 3 3/4	1,825
Jupiter	6.50	5.68	4.11	3.56	2.50	2.50	5/8 x 5/8 x 6	5/8 x 5/8 x 5 1/8	2,600
Gemini	6.50	5.68	4.11	3.56	2.50	2.50	5/8 x 5/8 x 6	5/8 x 5/8 x 5 1/8	4,853
Hercules	6.50	6.50	4.38	4.38	3.00	3.00	3/4 x 3/4 x 5 7/8	3/4 x 3/4 x 5 7/8	6,850

d = double reduction, t = triple reduction, q = quadruple reduction

<sup>2</sup> Contact factory for motor frame sizes other than "T" frame motors

\* TOLERANCES: 3.000" Diameter or less +.000/- .001


**NOTE: Dimensions subject to change. Certified dimensions of ordered material furnished upon request.**

# INSTALLATION AND MAINTENANCE INFORMATION

## Introduction

The following instructions apply to all standard horizontally mounted Planetgear speed reducers. To assure long life and performance of Planetgear speed reducers, the following practices should be followed.

## Nameplate

 <b>Rexnord</b>		PLANETGEAR SPEED REDUCER <small>MILWAUKEE, WISCONSIN USA</small>		<b>WARNING</b> ROTATING POWER TRANSMISSION PRODUCTS ARE DANGEROUS AND MUST BE PROPERLY GUARDED. INSTALL AND MAINTAIN GUARDS BEFORE START UP.			
						REDUCER ONLY	
MODEL NO.	<input type="text"/>	MAX. TORQUE OUT LB. IN.	<input type="text"/>	MOTOR HP	<input type="text"/>	DATE	<input type="text"/>
SERIAL NO.	<input type="text"/>	SERVICE HP	<input type="text"/>	SERVICE CLASS	<input type="text"/>	OIL CAP.	<input type="text"/>
CUST. PO.	<input type="text"/>	SERVICE FACTOR	<input type="text"/>	APPROX. U.S. GAL.			
SIZE	<input type="text"/>						
RPM IN	<input type="text"/>						
RATIO	<input type="text"/>						
RPM OUT	<input type="text"/>						
		AMBIENT TEMPERATURES 15F-60F    -10C-15C 50F-125F    10C-50C		LUBRICATION ACMA NO.    ISO GRADE 3                100 4                150		VISCOSITY RANGE cSt @ 40°C 90-110 135-165	
IMPORTANT: FILL TO THE LEVEL INDICATED WITH A PREMIUM QUALITY PETROLEUM BASED GEAR LUBRICANT CONTAINING OXIDATION RUST, AND FOAM INHIBITORS. FOR DETAILED LUBRICATION INSTRUCTIONS, SEE LUBRICATION BULLETIN. UNDER NORMAL CONDITIONS, THE LUBRICANT SHOULD BE CHANGED EVERY 2500 HOURS OR EVERY SIX MONTHS WHICHEVER COMES FIRST. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY.							

Operation of the reducer shall not differ from the application data warranted on the nameplate. Any change from this data requires submittal of new application information along with all nameplate data to the factory for engineering approval. All data changes require a new nameplate be issued and installed on the reducer. Note location of serial number and model number on the nameplate. When contacting the factory or sales representative, have the serial number and model number available as these unique numbers fully describe the reducer and allow for the fastest and most accurate exchange of information.

## Spare and Repair Parts

When ordering parts, always give complete data from the nameplate on the Planetgear reducer. Model number and serial number information is necessary. Complete nameplate data will assure that you are receiving the correct parts. If a new nameplate is received with the new parts, (as when a drive ratio is changed), replace the old nameplate on the drive with the new nameplate for future reference. Sun gears and carrier assemblies are stamped with a part number for easy identification.

## Alignment

If reducer is received coupled to a motor, it has been aligned at the factory. However, because alignment may have been disturbed in shipment, it is best to check alignment and realign if necessary. The reliability and long life of the reducer requires careful installation of accessories and accurate alignment of the connecting shafts.

If the reducer is mounted onto a Planetgear baseplate and must be direct coupled to a drive shaft, shimming should be done underneath the baseplate. Shim under the baseplate until the baseplate is level and all feet are on the same plane.

After first week — Check alignment of the total system and realign if necessary. Also tighten all bolts and plugs as required. Remember to remove the load from the system before attempting to service the reducer. This action reduces the possibility of unexpected motion in the system. Check coupling for alignment to make sure that setting or vibration has not caused excessive misalignment.

## Coupling Alignment

Detailed instruction for installation of Rexnord Elastomer couplings are available from the factory, your Sales Engineer, or local distributor. The following are general instruction:

- Correct for angular misalignment by measuring the distance from coupling hub (on motor shaft) to coupling hub (on reducer input shaft) at four places each 90 degrees apart. Adjust or shim until the four readings are equal.

- Correct for parallel offset misalignment by placing a straight edge across the hub flange in two places 90 degrees apart. Adjust or shim until the straight edge lays flat on both ends.
- Recheck for angular misalignment, adjust if necessary and tighten down the connected equipment.
- Install Elastomer center member elements. Tighten all cap screws to the correct torque value listed in the coupling installation sheet.

## Face Mounted Scoops

The scoops have been designed to accommodate the motor weight and the starting torque based on the correct selections in this catalog and using standard 1750, 1430, 1170 and 950 AC motors. If a customer feels deflection is excessive, we suggest either placing a support under the end of the scoop, or drilling a hole in the end of the face scoop and installing a jack screw.

## Pulley and Sheave Connections

Mount power takeoff as close as possible to the gear case in order to reduce the cantilever effect of overhung loads on the shaft bearings. If the power takeoff has only one hub, that hub should be on the outside with the plate closest to the seal cage of the reducer. Adjust belts to manufacturer specifications to prevent overtightening.



# INSTALLATION AND MAINTENANCE INFORMATION LUBRICATION

## Gear Drive Lubrication

Read and carry out all instructions on the nameplate and review all warning tags. Determine minimum and maximum ambient temperatures the unit is to operate in. From the nameplate or the *Ambient Temperature Table* below, determine the proper AGMA or ISO grade lubricant for those temperature conditions and select an appropriate oil. SAE oils apply to gear lubricants only. Automotive oils are not recommended. All drives are splash lubricated by gear rotation with even distribution to all gear meshes and bearings.

Determine specific oil quantity needed. **From the nameplate, determine the quantity of oil needed to operate the gear drive.**

### Ambient Temperature – Speeds > 6 RPM Out

Ambient Temp.	Viscosity @ 40°C Centistokes	AGMA Grade #	ISO Grade #
-10°C to 15°C 15°F to 60°F	90 - 110	3	100
10°C to 50°C 50°F to 125°F	135 - 165	4	150

### Ambient Temperature – Speeds < 6 RPM Out

Ambient Temp.	Viscosity @ 40°C Centistokes	AGMA Grade #	ISO Grade #
-10°C to 15°C 15°F to 60°F	198 - 242	5	220
10°C to 50°C 50°F to 125°F	288 - 352	6	320

## Petroleum Based R&O Gear Oils

Maximum operating temperature of lubricants: 200°F (93°C)  
 AGMA 3: 15°F - 60°F AGMA 4: 50°F - 125°F

Manufacturer	AGMA Viscosity Grade 3	AGMA Viscosity Grade 4
	Lubricant	Lubricant
American Ind. Oil Co.	American Ind. Oil #100	American Ind. Oil #150
Chevron U.S.A. Inc.	AW Machine Oil 100	AW Machine Oil 150
Cities Service Co.	Citgo Pacemaker 100	Citgo Pacemaker 150
Conoco Inc.	Dectol R&O Oil 100	Dectol R&O Oil 150
Exxon Company, U.S.A.	Teressitic 100	Teressitic 150
Gulf Oil Corp.	Harmony 100	Harmony 150 D
Gulf Canada Limited	Harmony 66	Harmony 77
Imperial Oil Ltd.	Teresso 100	Teresso 150
Mobil Oil Corp.	DTE Heavy	DTE Extra Heavy
Phillips Petroleum Co.	Magnus Oil 100	Magnus Oil 150
Shell Oil Co.	Morlina 100	Morlina 150
Shell Canada Limited	Tellus 100	Tellus 150
Standard Oil Co. (Ohio)	Industron 66	Industron 80
Texaco Inc.	Regal Oil R&O 100	Regal Oil R&O 150
Texas Canada Inc.	Regal R&O 100	Regal R&O 150
Union Oil Co. of Calif. (East)	Unax RX 100	Unax RX 150
Union Oil Co. of Calif. (West)	Turbine Oil 100	Turbine Oil 150

Maximum operating temperature of lubricants: 200°F (93°C)  
 AGMA 5: 15°F - 60°F AGMA 6: 50°F - 125°F

Manufacturer	AGMA Viscosity Grade 5	AGMA Viscosity Grade 6
	198-242	288-352
Lubricant		
American Ind. Oil Co.	Amer. Ind. Oil 220	Amer. Ind. Oil 320
BP Oil Co.	Energol HLP-HD 220	...
Chevron U.S.A., Inc.	Machine Oil AW 220	Machine Oil AW 320
Citgo Petroleum Corp.	Citgo Pacemaker 220	Citgo Pacemaker 320
Conoco Inc.	Dectol R&O Oil 220	Dectol R&O Oil 320
Exxon Company, U.S.A.	Teressitic 220	Teressitic 320
Houghton International, Inc.	hydro-Drive HP 1000	...
Imperial Oil Ltd.	Teresso 220	Teresso 320
Kendall Refining Co.	...	...
Keystone Lubricants	KLC-50	...
Lyondell Petrochemical (ARCO)	Duro 220	Duro 320
Mobil Oil Corp.	DTE Oil BB	DTE Oil AA
Pennzoil Products Company	Pennzbell AW Oil 220	Pennzbell AW Oil 320
Petro-Canada Products	Premium R&O Oil 220	Premium R&O 320
Phillips 66 Co.	Magnus Oil 220	Magnus Oil 320
Shell Oil Co.	Morlina 220	Morlina 320
Shell Canada Limited	Tellus 220	Tellus 320
Sun Oil Co.	Sunvis 9220	...
Texaco Lubricants	Regal Oil R&O 220	Regal Oil R&O 320
Unocal 76 (East)	Unax RX 220	Unax AW 320
Unocal 76 (West)	Turbine Oil 220	Turbine Oil 320
Valvoline Oil Co.	Valvoline AW ISO 220	Valvoline AW ISO 320

## Operating Temperature

If the speed reducer operates under extreme conditions or is exposed to large temperature fluctuations, the use of a synthetic oil is recommended. Contact lubrication supplier for recommendations.

Note: The synthetic lubricant should conform to the requirements of ANSI/AGMA 9005-D94.

If the speed reducer operates in an environment where the temperature fluctuations are predictable, choose an oil viscosity that is recommended for that given temperature (i.e. for cold weather operation, use an oil that will circulate freely at all times). The pour point of the oil should be 9°F(5°C) less than the minimum external temperature during reducer operation. During hot weather, use a higher viscosity oil that will not thin out and lose its lubricating qualities.

Special measures should be taken to protect drives operating in direct sunlight at ambient temperatures over 38°F (100°F). This protection can consist of a canopy over the drive or reflective paint on the drive. If neither is possible, a heat exchanger or other cooling device may be required to prevent the reducer sump temperature from exceeding the allowable maximum oil temperature of 200°F(93°C).

Temperatures in excess of 120°F(49°C) feel hot to the human hand. Planetgear reducers can be operated with reducer sump oil temperatures of up to 200°F (93°C).

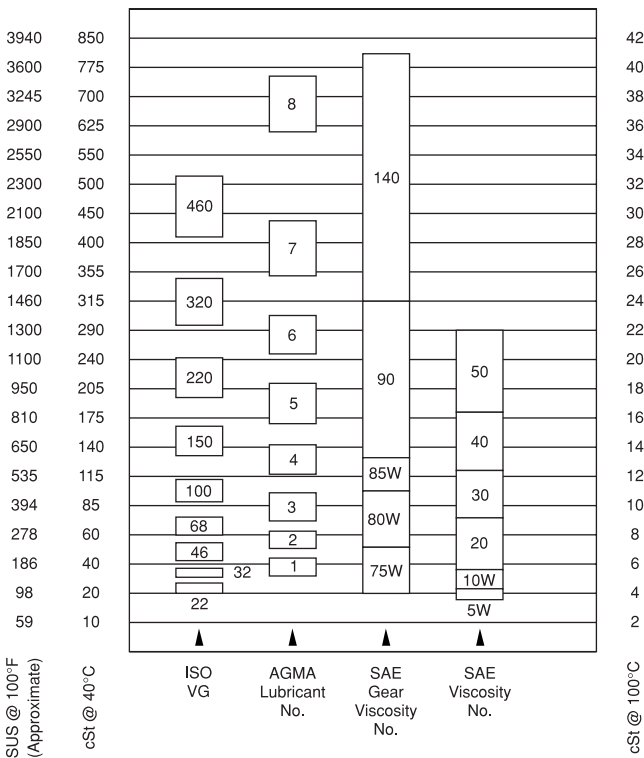
## Oil Levels

Determine specific oil quantity needed. From the nameplate or the oil capacity chart below, determine the quantity of oil in gallons needed to operate the reducer.

## LUBRICATION CHANGES

### Oil

For normal conditions, change oil every six months or 2,500 hours, whichever comes first. If operating under abnormal conditions such as high temperature, severe duty, moisture or particle contamination, oil may need to be changed more frequently. Reference Owners' Manual for maintenance.





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## Why Choose Rexnord?

When it comes to providing highly engineered products that improve productivity and efficiency for industrial applications worldwide, Rexnord is the most reliable in the industry. Commitment to customer satisfaction and superior value extend across every business function.

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The highest quality products are designed to help prevent equipment downtime and increase productivity and dependable operation.

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