Westinghouse Electric Corporation
Medium Motor and Gearing Division
Buffalo, New York, U.S.A. 14240

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Application Data
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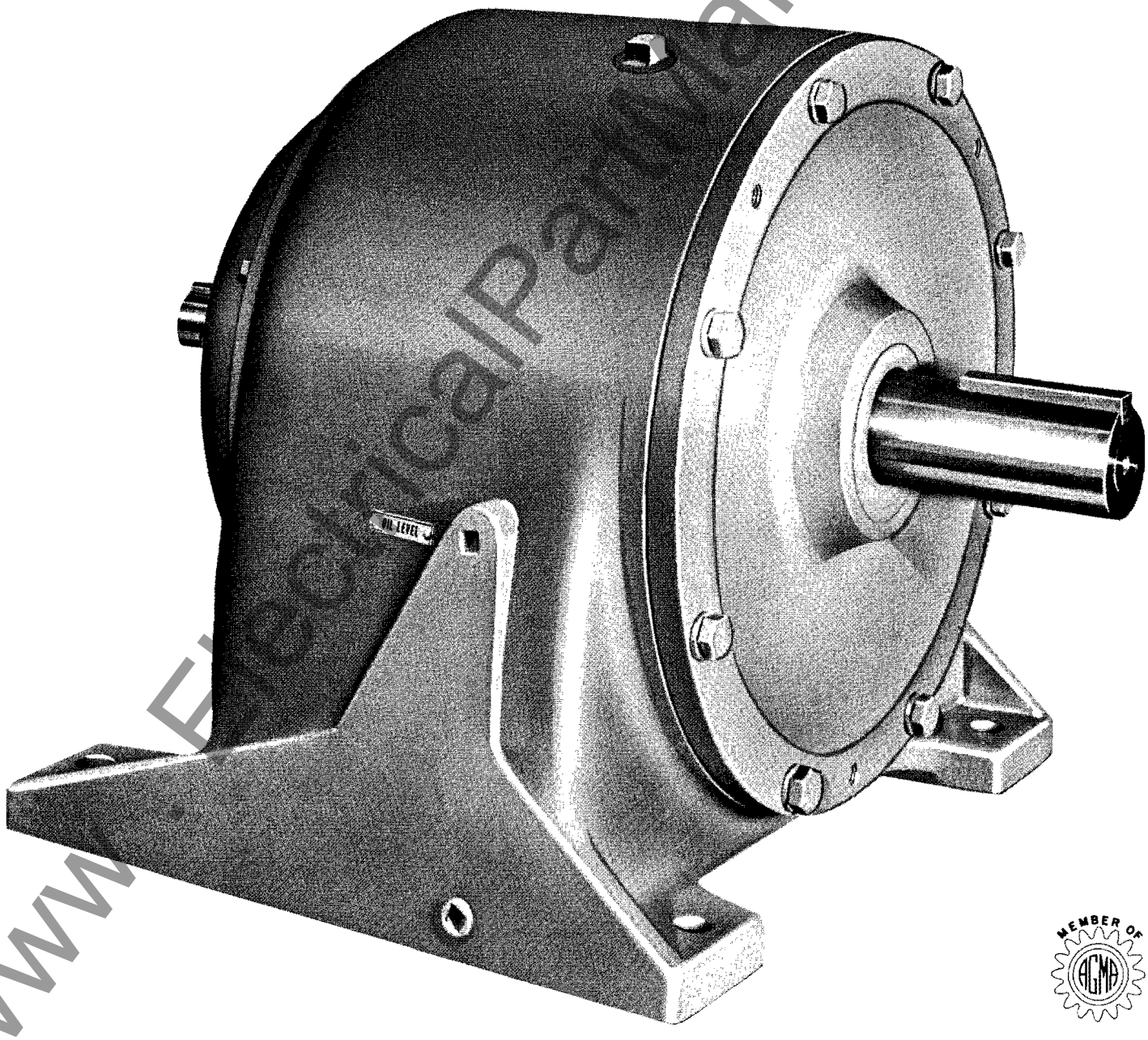
Concentric Shaft Type
Single, Double, Triple and Quadruple
Reduction

Moduline® Speed Reducers



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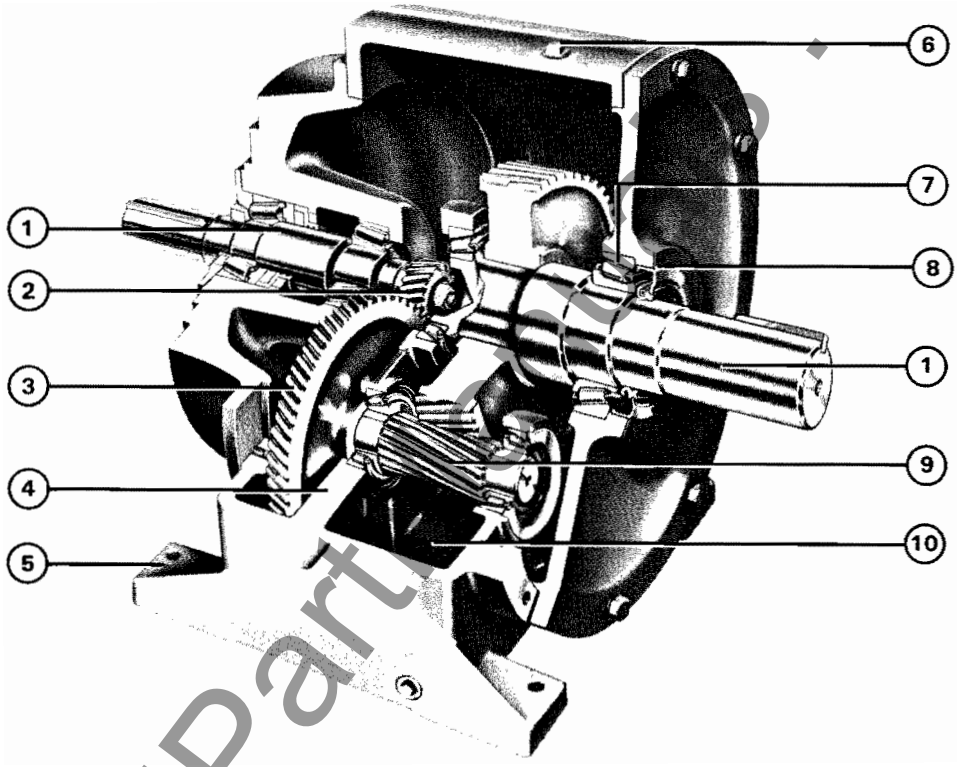
Moduline concentric shaft speed reducers reflect many years of experience in gearing products utilizing the flexibility of the modular concept to provide readily available drives, closely tailored for individual applications. Ratios are available from 1.25:1 to 985.3:1 in incremental ratings from .16 through 364 horsepower.



Construction

① Input and output shafts of chrome-moly steel are supported on wide bearing spans to provide generous overhung load capacity.

② The high speed pinion and gear are mounted on splined shafts. The splines are cold rolled and the major diameters ground to close tolerances to assure concentricity of the gear and pinion with the shaft. This design permits easy change in the high speed gear set.

③ All gears and pinions are made of high quality chrome-moly steel generated on Pfauter hobbers, and then heat treated by a special Westinghouse process. This assures gears of consistent accuracy, resulting in long trouble-free life and quiet operation.

④ A sturdy-one-piece cast iron housing with integrally cast machined bearing supports provides proper internal alignment of components. The inherent corrosion resistance of cast iron allows placement of the unit in many severe atmospheres without special finishes.

⑤ Rugged feet are integrally cast on double, triple and quadruple reduction units to provide maximum strength. Foot pads are accurately milled to assure ease of alignment.

⑥ A combination breather-filler plug keeps overall height at a minimum.

⑦ Single row tapered roller bearings are used on all shafts. These bearings are conservatively selected in accordance with bearing manufacturers' recommendations to provide maximum load carrying capacity and reliability.

⑧ Dual-lip seals are used exclusively by Westinghouse to retain oil effectively and to protect against entry of contaminants. This assures trouble-free long life.

⑨ Helical gears, pioneered by Westinghouse, permit more than one gear tooth face to carry the load, and allow gradual progressive transmission of the load from tooth to tooth.

⑩ Large oil reservoir and splash system provide positive lubrication of all gears and bearings.

Selection and Pricing

Establish the following information to select a Westinghouse Moduline speed reducer.

1. Type of prime mover (motor, engine, diesel).

2. Actual horsepower or output torque (in inch-pounds) requirement.

3. AGMA service factor, pages 4 and 5.

4. Equivalent horsepower or torque (no's. 2 x 3).

5. Input or output rpm and gear ratio.

6. Determine unit size from reducer selection tables on pages 6-13.

7. Check the thermal horsepower rating if the horsepower or torque rating appears in bold type. When using the torque selection method convert the actual required torque to horsepower using the following formula:

$$\text{Actual Hp} = \frac{\text{Actual Torque (without service factor)} \times \text{Output Speed}}{63{,}000}$$

8. Check the overhung load capacity of the reducer if the application does not call for coupled service. Refer to pages 14 and 15.

9. Refer to Price List 2986-3 for list prices of the reducer and any modifications.

Selection and Pricing Examples

A. Horsepower Method:
Select a Moduline reducer to drive a reciprocating single cylinder compressor 10 hours a day, requiring 28 actual Hp. Compressor is to operate at 350 Rpm. Prime mover is a 30 Hp electric motor at 1750 Rpm.

Step 1: Prime mover – electric motor.

Step 2: Actual horsepower – 28.

Step 3: From AGMA service factor chart, page 4, application gives SF=1.75.

Step 4: Equivalent Hp: 28 x 1.75=49.0 Hp.

Step 5: Input Rpm=1750. Output Rpm=350.

Step 6: For the given input-output speed combination and required equivalent horsepower, we find from the reducer selection table on page 6 that a size 54D with a horsepower rating of 82.5 Hp is adequate for the application.

Step 7: Since the horsepower rating of a size 54D appears in bold type it is necessary to check the thermal capacity. From the table on page 5 we find that the thermal horsepower capacity of a 54D at 1750 Rpm input and 350 Rpm output is 65 Hp. This value exceeds the actual required horsepower of 28 Hp and thus no thermal problem exists.

Step 8: Check overhung load capacity and allowable thrust loads from pages 14 and 15.

B. Torque Method:
Select a Moduline reducer to drive a lumber mill debarking drum 10 hours per day, requiring 16,000 inch-pounds torque. The debarking drum is to operate at 190 Rpm. The prime mover is a 50 Hp electric motor at 1750.

Step 1: Prime mover – electric motor.

Step 2: Actual torque – 16,000 inch-pounds.

Step 3: From AGMA service factor chart, page 4, application gives SF=1.75.

Step 4: Equivalent torque – 16,000 x 1.75=28,000 inch-pounds.

Step 5: Input Rpm – 1750. Output Rpm=190.

Step 6: For the given input-output speed combination and required equivalent torque, we find from the reducer selection table on page 6 that a 64D gear unit with a torque rating of 31,700 in.-lbs. is adequate for the application.

Step 7: Since the torque rating of a size 64D appears in bold type it is necessary to check the thermal capacity. Using the conversion formula we convert 16,000 inch-pounds actual torque to 48.25 Hp. From the table on page 5 we find that the thermal horsepower capacity of a 64D at 1750 Rpm input and 190 Rpm output is 77 Hp. This value exceeds the actual required horsepower of 48.25 Hp and thus no thermal problem exists.

Step 8: Check overhung load capacity and allowable thrust loads from pages 14 and 15.

Ordering Information
Designation System: The first two numbers represent the gear frame size. The letter S, D, T or Q represents single, double, triple or quadruple reduction (e.g. 21D).

Note: The following are Moduline speed reducer frame sizes:
S: 10, 21, 32, 43, 54, 76.
D and T: 10, 21, 32, 43, 54, 64, 76, K88, 88, 92.
Q: 32, 43, 54, 64, 76, 88.

How to Order
The following information is required to order a Westinghouse Moduline speed reducer:
1. Hp, input speed and type of prime mover (motor, engine, etc.).
2. Output speed, type of driven equipment (conveyor, kiln, etc.), gear ratio, service factor.
3. Unit designation (example: 21D).
4. Mounting Position.
5. Any modifications that may be required (example: mounting customer's pinion).
6. Coupling sizes for output and input shaft if required.

Service Factors
To provide long life and reliability for any given application, a suitable service factor must be applied to the gear drive rating.

The required equivalent horsepower or equivalent torque necessary to select a reducer from the rating tables is found by multiplying the load horsepower or torque by the service factor.

The gear drive selected will require a rating equal to or in excess of the equivalent horsepower or equivalent torque.

Table 1 shows the recommended minimum service factors for various load characteristics and duration of service with common types of prime movers.

Table 2 lists "Application Classification" for many common speed reducer applications, according to the nature of the load and the usual duty cycle. The three types of load classifications shown: uniform, moderate shock and heavy shock, are used in conjunction with Table 1 to arrive at a numerical value. It is not possible to list all possible applications requiring gear drives, but a sufficient variety of types is covered to serve as a guide for other applications.

It should be noted that the values given in the tables are based on field experience of average operating conditions for each class of equipment and may not be correct in all cases, due to unique operating conditions or design of the driving or driven equipment.

Proper service factors can be determined if full operating conditions are known, and it is necessary to have this data before a final gear drive selection is made. Any drive for use under abnormal conditions must be referred to Westinghouse.

Basic conditions to be observed before applying service factors are as follows:

1. Excessive Overloads Mechanical
The maximum momentary or starting load must not exceed 200 percent of rated load (100% overload). Rated load is defined as the unit rating with a service factor of 1.0. Driven equipment with high inertia loading, sleeve bearings, etc., may require higher service factors than indicated because of the high momentary torque required for breakaway. Expected breakaway and shock load torque must not exceed 200% rated gear torque.

2. Oversize Prime Mover. The practice of using oversize motors for motor standardization or starting conditions must be given special attention due to the potential high starting torque available.

Selecting reducers on the basis of calculated or brake horsepower is satisfactory provided the available motor does not have a starting torque which exceeds the capacity of the reducer. For cases where the motor rating exceeds the calculated Hp by a considerable amount, it is advisable to have at least a service factor of 1.0 of the motor rating for standard Nema 'B' motors.

3. Braking Conditions. When the rating of a shaft mounted or motor mounted brake exceeds the motor rating, the rating of the brake must be used in selection of the reducer.

4. Drive-Train Vibrations. Gear reducers are sold with the understanding that the entire system of rotating parts is free from serious critical speeds or torsional vibrations. Calculation required to check entire system is the responsibility of the systems builder, however details of reducer rotating parts sufficient for such calculations, are available on request at time of order.

5. Pulsating Loading. The responsibility for satisfactory operating of reducers driving or driven by pulsating or reciprocating apparatus such as compressors, pumps, internal combustion engines is assumed by Westinghouse provided that:

a. The gears are not operated with torque reversals at the gear mesh, except when starting or stopping.

b. When loaded, the torque variation at the gear mesh does not exceed ±25% of average transmitted torque.

c. When unloaded, the torque variation at the gear mesh does not exceed ±15% of rated torque with no negative torque.

Thermal Horsepower

The thermal horsepower rating represents the actual horsepower that a gear drive will transmit continually for more than three (3) hours without overheating. Maximum sump temperature is not to exceed 200°F.

It is not necessary to check thermal horsepower ratings when the continuous operating period is three (3) hours or less, and the shut-down time equals or exceeds the running time. If however, the running time exceeds the shut down time, selection must be made on the basis of an adequate thermal rating. It is important that the thermal horsepower be checked prior to application, for if the unit develops heat at a faster rate than can be dissipated, premature failure may occur.

When the horsepower or torque rating appears in **bold** type, the actual horsepower required (without service factor) must be compared with the thermal horsepower capacity. If the actual horsepower load exceeds the thermal capacity a fan may be added or a larger unit selected.

Table 1: Recommended Service Factors

Prime Mover	Duration of Service	Driven Machine Load Classification		
		Uniform	Moderate Shock	Heavy Shock
Electric Motor, Steam Turbine, Hydraulic Motor	Occasional ½ hr./day	.50	.80	1.25
	Intermittant 3 hrs./day	.80	1.00	1.50
	Over 3 through 10 hrs./day	1.00	1.25	1.75
	Over 10 hrs./day	1.25	1.50	2.00
Multi-Cylinder Internal Combustion Engine	Occasional ½ hr./day	.80	1.00	1.50
	Intermittant 3 hrs./day	1.00	1.25	1.75
	Over 3 through 10 hrs./day	1.25	1.50	2.00
	Over 10 hrs./day	1.50	1.75	2.25
Single Cylinder Internal Combustion Engine	Occasional ½ hr./day	1.00	1.25	1.75
	Intermittant 3 hrs./day	1.25	1.50	2.00
	Over 3 through 10 hrs./day	1.50	1.75	2.25
	Over 10 hrs./day	1.75	2.00	2.50

Overhung Loads and Thrust Loads

An overhung load is imposed upon a shaft when a pinion, sprocket or sheave is used as a power takeoff. The magnitude of the load varies with the type of connection and its location from the shaft bearing. Check the overhung load capacity of the reducer if the application does not call for coupled service.

External thrust loads can be imposed on a gear drive by mixers, agitators or other similar equipment when connected by solid couplings and also some flexible couplings. Check the external thrust capacity of the reducer against the calculated thrust value.

Table 2: Application Classification Loads: U = Uniform, M = Moderate Shock, H = Heavy Shock

Application	Load
Agitators	
Pure liquids	U
Liquids and solids	M
Liquids, variable density	M
Blowers	
Centrifugal	U
Lobe	M
Vane	U
Brewing and Distilling	
Bottling machinery	U
Brew kettles, cont. duty	U
Cookers, continuous duty	U
Mash tubs, cont. duty	U
Scale hopper, frequent starts	M
Can Filling Machines	U
Cane Knives●	M
Car Dumpers	H
Car Pullers	M
Clarifiers	U
Classifiers	M
Clay Working Machinery	
Brick press	H
Briquette machine	H
Clay working machinery	M
Pug mill	M
Compressors	
Centrifugal	U
Lobe	M
Reciprocating	
Multi-cylinder	M
Single cylinder	H
Conveyors, Uniformly Loaded or Fed	
Apron	U
Assembly	U
Belt	U
Bucket	U
Chain	U
Flight	U
Oven	U
Screw	U
Conveyors, Heavy Duty-Not Uniformly Fed	
Apron	M
Assembly	M
Belt	M
Bucket	M
Chain	M
Flight	M
Live roll②	
Oven	M
Reciprocating	H
Screw	M
Shaker	H
Cranes and Hoists	
Dry dock cranes, see Table 3.	
Main hoists	U
Bridge travel②	
Trolley travel②	
Crushers	
Ore	H
Stone	H
Sugar①	M
Dredges	
Cable reels	M
Conveyors	M
Cutter head drives	H
Jig drives	H
Maneuvering winches	M
Pumps	M
Screen drive	H
Stackers	M
Utility winches	M
Elevators	
Bucket, uniform load	U
Bucket, heavy load	M
Bucket, continuous	U
Centrifugal discharge	U
Escalators	U
Freight	M
Gravity discharge	U
Man lifts②	
Passenger②	
Extruders (Plastic)①	
Film	U
Sheet	U
Coating	U
Rods	U
Pipe	U
Tubing	U
Blow molders	M
Pre-plasticizers	M
Fans	
Centrifugal	U
Cooling towers	
Induced draft②	
Forced draft①	U
Induced draft	M
Large (mine, etc)	M
Large industrial	M
Light (small diameter)	U
Feeders	
Apron	M
Belt	M
Disk	U
Reciprocating	H
Screw	M
Food Industry	
Beet slicer	M
Cereal cooker	U
Dough mixer	M
Meat grinders	M
Generators (not Welding)	U
Hammer Mills	H
Hoists	
Heavy duty	H
Medium duty	M
Skip hoists	M
Laundry Tumblers	M
Laundry Washers	
Reversing	M
Line Shafts	
Driving processing equipment	M
Light	U
Other line shafts	U
Lumber Industry	
Barkers-hydraulic-mech'l	H
Burner conveyor	M
Chain saw and drag saw	H
Chain transfer	H
Craneway transfer	H
De-barking drum	H
Edger feed	M
Gang feed	M
Green chain	M
Live rolls	H
Log deck	H
Log haul – incline	H
Log haul – welltype	H
Log turning device	H
Main log conveyor	H
Off bearing rolls	M
Planer feed chains	M
Planer floor chains	M
Planer tilting hoist	M
Re-saw merry-go-round conveyor	M
Roll cases	H
Slab conveyor	H
Small waste conveyor-Belt	U
Small waste conveyor-Chain	M
Sorting table	M
Tipple hoist conveyor	M
Tipple hoist drive	M
Transfer conveyor	M
Transfer rolls	M
Tray drive	M
Trimmer feed	M
Waste conveyor	M
Machine Tools	
Bending roll	M
Notching press, belt driven②	
Plate planer	H
Punch press, gear driven	H
Tapping machines	H
Other machine tools	
Main drives	M
Auxiliary drives	U
Metal Mills	
Draw bench, carriage	M
Draw bench, main drive	M
Forming machines	H
Pinch dryer and scrubber rolls, reversing②	
Slitters	M
Table conveyors	
Non-reversing	
Group drives	M
Individual drives	H
Reversing②	
Wire drawing and flattening machine	M
Wire winding machine	M
Mills, Rotary Type	
Ball and Rod	
Spur ring gear①	H
Helical ring gear●	M
Direct connected①	H
Cement kilns①	M
Dryers and coolers①	M
Kilns	M
Pebble①	M
Plain and wedge bar①	M
Tumbling barrels	H
Mixers	
Concrete mixers, continuous	M
Concrete mixers, intermittent	M
Constant density	U
Variable density	M
Oil Industry	
Chillers	M
Oil well pumping②	
Paraffin filter press	M
Rotary kilns	M
Paper Mills●●	
Agitator (mixer)	M
Agitator (pure liquors)	U

① To be selected on basis of 24 hr. service only.

② Refer to Westinghouse.

③ Apply service factors to motor rated hp. at base speed.

Table 2: Application Classification Loads: U = Uniform, M = Moderate Shock, H = Heavy Shock (Continued)

Application	Load
Barkers, mechanical	H
Barking drum	H
Beaters	M
Breaker stack	U
Calender	U
Chip feeder	M
Chipper	H
Coating rolls	U
Conveyors:	
Chip, bark, chem.	U
Log (incl. slab)	H
Couch roll	U
Cutter	H
Cylinder mold	U
Dryers, paper machine and conveyor type	U
Embosser	U
Extruder	M
Fourdrinier rolls	U
Jordan	M
Kiln drive	M
Mt. Hope rolls	U
Paper rolls	U
Platter	M
Presses, felt & suction	U
Pulper	H
Pumps, vacuum	M
Reel, surface type	U
Screens, chip and rotary	M
Screens, vibrating	H
Size press	U
Super calenders	U
Thickener, ac drive	M
Thickener, dc drive	U
Washer, ac drive	M
Washer, dc drive	U
Wind and unwind stands, core type	U
Winders, surface type	U
Yankee dryer	U
Plastics Industry	
Intensive Internal Mixers	
(a) Batch Mixers	SF = 1.75
(b) Continuous Mixers	SF = 1.50
Batch Drop Mill – 2 smooth rolls	SF = 1.25
Continuous Feed, Holding & Blend Mill	SF = 1.25
Compounding Mills	SF = 1.25
Calenders	SF = 1.50
Extruders	SF = 1.50
(a) Variable Speed Drive	SF = 1.50
(b) Fixed Speed Drive	SF = 1.75
Printing Presses②	
Pullers	
Barge haul	H
Pumps	
Centrifugal	U
Proportioning	M
Reciprocating	
Single acting, 3 or more cylinders	M
Double acting, 2 or more cylinders	M
Single acting, 1 or 2 cylinders②	
Double acting, single cylinder②	
Rotary – gear type	U
Rotary – lobe, vane	U
Rubber Industry	
Intensive Internal Mixers	
(a) Batch Mixers	SF = 1.75
(b) Continuous Mixers	SF = 1.50
Mixing Mill – 2 smooth rolls	SF = 1.50
(if corrugated rolls are used, then use the same service factors that are used for a Cracker Warmer)	
Batch Drop Mill – 2 smooth rolls	SF = 1.50
Cracker Warmer – 2 Roll; 1 corrugated Roll	SF = 1.75
Cracker – 2 corrugated Roll	SF = 2.00
Holding, Feed and Blend Mill – 2 Roll	SF = 1.25
Refiner – 2 Roll	SF = 1.50
Calenders	SF = 1.50
Extruders	
(a) Continuous Screw Operation	SF = 1.50
(b) Intermittent Screw Operation	SF = 1.75
Sand Muller	M
Screens	
Air washing	U
Rotary – stone or gravel	M
Traveling water intake	U
Sewage Disposal Equipment	
Bar screens	U
Chemical feeders	U
Collectors, circuline or Straightline	U
Dewatering screws	M
Grit collectors	U
Scum breakers	M
Slow or rapid mixers	M
Sludge collectors	U
Thickeners	M
Vacuum filters	M
Slab Pushers	M
Steering Gear②	
Stokers	U
Sugar Industry	
Cane knives①	M
Crushers①	M
Mills①	H
Te tile Industry	
Batchers	M
Calenders	M
Cards	M
Dry cans	M
Dryers	M
Dyeing machinery	M
Knitting machines②	
Looms	M
Mangles	M
Nappers	M
Pads	M
Range drives●	
Slashers	M
Soapers	M
Spinners	M
Tenter frames	M
Washers	M
Winders	M
Windlass②	

① To be selected on basis of 24 hr. service only.
● Refer to Westinghouse.
② Apply service factors to motor rated h.p. at base speed.

Table 3: Application for Dry Dock Cranes (Hammerhead, Rotating and Whirler, Stationary or Moving) Due to the nature of these crane drives, the following service factors are to be used for any duration of service.

Application	Load Classification
Main Hoist	**1.00**
Auxiliary Hoist	**1.00**
Boom (Luffing)	**1.00**
Rotating (Swing or Slow)	**1.25**
Tracking (Drive Wheels)	**1.50**

Thermal Horsepower

The table to the right gives the actual horsepower values that the reducers will transmit continually for more than three (3) hours without overheating. Values are given **only** if the thermal horsepower is less than the mechanical horsepower. If the thermal capacity shown without fan is not sufficient, check the ratings with fan.

Thermal Horsepower Ratings are based on the following conditions:

1. Ambient temperatures must not exceed 100°F.
2. Adequate air circulation around gear unit.
3. Gear unit must not be covered with any foreign material (coal, cement, grain dust, etc.) which will prevent proper heat dissipation.
4. Use of proper gear lubricating oil.
5. Correct coupling alignment.

High Speed Shaft Rpm	AGMA Ratio ± 4%	Approx. L.S. Shaft Rpm	Gear Unit Size										
			Thermal Horsepower – WITHOUT Fan							Thermal Horsepower – WITH Fan①			
			54D	64D	76D	76S	K88D	88D	92D	76D	K88D	88D	92D
1750	1.225	1400	..	..	..	96	...	...	...	...	...	...	...
	1.500	1165	..	..	..	98	...	...	...	...	...	...	...
	1.837	950	..	..	..	100	...	...	...	...	...	...	...
	4.134	420	65	..	85	...	...	125	...	170	...	240	...
	5.06	350	65	76	85	...	125	125	...	170	240	240	...
	6.20	280	66	76	87	...	127	127	150	174	243	243	282
	7.59	230	66	77	88	...	128	128	150	②	②	245	284
	9.30	190	..	77	89	...	130	130	151	②	②	②	286
	11.39	155	..	..	91	...	132	132	152	②	②	②	②
	13.95	125	..	..	92	...	...	135	153	②	...	②	②
	17.09	100	..	..	..	...	...	...	155	...	...	...	②
1430	1.225	1150	..	..	..	97	...	...	...	...	...	...	...
	1.500	950	..	..	..	99	...	...	...	...	...	...	...
	4.134	350	66	..	87	...	...	127	...	139	...	203	...
	5.06	280	66	76	88	...	128	128	...	141	205	205	...
	6.20	230	67	77	91	...	130	130	150	145	208	208	240
	7.59	190	..	77	91	...	132	132	151	145	②	211	242
	9.30	155	..	..	92	...	133	133	152	②	②	②	243
	11.39	125	..	..	93	...	...	135	154	②	...	②	②
	13.95	100	..	..	..	...	...	...	156	...	...	...	②
1170	1.225	950	..	..	..	98	...	...	...	...	...	...	...
	4.134	280	67	..	89	...	...	128	...	125	...	180	...
	5.06	230	67	77	91	...	130	130	...	127	182	182	...
	6.20	190	..	78	92	...	132	132	152	129	184	184	212
	7.59	155	..	..	93	...	134	134	153	②	②	188	214
	9.30	125	..	..	94	...	...	136	155	②	...	②	②
	11.39	100	..	..	..	...	...	...	156	...	...	...	②
870	4.134	210	68	..	91	...	...	129	...	109	...	155	...
	5.06	175	..	78	92	...	...	131	...	110	...	157	...
	6.20	140	..	..	93	...	...	133	154	111	...	159	②
	7.59	115	..	..	94	...	...	135	155	②	...	②	②
	9.30	95	..	..	..	...	...	...	156	...	...	...	②

① Fans are available **only** on reducer sizes 76D, K88D, 88D and 92D.
② Reducer with fan is not thermally limited.

1750 Rpm Input – 1.25 to 4.13 Ratios
Torque Ratings in 1000 Inch-Pounds

AGMA Ratios ±3%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 10S	21S	32S	10D ①	43S	21D ①	54S	32D ①	43D ①	76S	54D ①	76D ①	88D ①
1.225	1400	Mechanical Hp	12.8	19.9	29.1	....	53.3	....	82.1	....	....	**162**	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	**7.45**	....	....	....
1.500	1165	Mechanical Hp	10.6	15.8	23.5	....	44.1	....	69.0	....	....	**134**	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	**7.45**	....	....	....
1.837	950	Mechanical Hp	8.77	13.5	20.0	....	36.2	....	55.9	....	....	**110**	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	**7.45**	....	....	....
2.250	780	Mechanical Hp	7.11	11.0	16.0	....	29.4	....	45.3	....	....	89.8	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
2.756	640	Mechanical Hp	5.66	8.92	13.2	....	24.2	....	37.3	....	....	74.0	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
3.375	520	Mechanical Hp	4.62	7.02	10.5	....	19.1	....	29.4	....	....	58.4	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
4.134	420	Mechanical Hp	3.91	5.91	8.62	12.1	16.1	18.8	24.9	34.3	41.0	48.8	**80.6**	**303**	**329**
		Torque	.59	.90	1.34	1.8	2.44	2.8	3.76	5.1	6.1	7.45	**12.0**	**45.0**	**48.6**

1750 Rpm Input – 5.06 to 31.39 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ±4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 10D	21D	21T	32D	32T	43D	43T	54D	54T
5.06	350	Mechanical Hp	11.8	18.0	....	34.9	....	39.3	....	**82.4**	....
		Torque	2.2	3.3	....	6.5	....	7.3	....	**15.3**	....
6.20	280	Mechanical Hp	11.1	18.2	....	36.0	....	40.1	....	**79.7**	....
		Torque	2.5	4.2	....	8.3	....	9.0	....	**17.6**	....
7.59	230	Mechanical Hp	12.1	18.9	....	31.0	....	40.3	....	**77.7**	....
		Torque	3.3	5.1	....	8.4	....	11.0	....	**21.2**	....
9.30	190	Mechanical Hp	10.1	17.0	....	25.4	....	39.5	....	64.8	....
		Torque	3.4	5.6	....	8.6	....	13.3	....	21.8	....
11.39	155	Mechanical Hp	8.00	13.9	....	21.4	....	33.1	....	54.4	....
		Torque	3.4	5.7	....	8.8	....	13.5	....	22.2	....
13.95	125	Mechanical Hp	6.39	11.1	....	17.2	....	26.5	....	43.9	....
		Torque	3.3	5.8	....	8.9	....	13.7	....	22.2	....
17.09	100	Mechanical Hp	5.40	9.25	....	13.9	....	22.9	....	37.6	....
		Torque	3.3	5.7	....	8.8	....	14.0	....	23.0	....
20.93	84	Mechanical Hp	4.21	7.19	....	11.0	....	19.2	....	31.7	....
		Torque	3.1	5.3	....	8.3	....	14.2	....	23.4	....
25.63	68	Mechanical Hp	2.62	5.30	....	8.41	....	14.8	....	26.0	....
		Torque	2.4	4.9	....	7.6	....	13.6	....	23.8	....
31.39	56	Mechanical Hp	2.26	3.98	5.32	6.13	8.18	9.60	12.6	17.0	23.0
		Torque	2.5	4.4	6.1	6.9	9.4	10.6	14.7	18.8	26.5

AGMA Ratios ±4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 64D	64T	76D	76T	K88D	88D	88T	92D
5.06	350	Mechanical Hp	**161**	....	**250**	....	....	**323**	....	....
		Torque	**29.2**	....	**46.5**	....	....	**58.5**	....	....
6.20	280	Mechanical Hp	**133**	....	**212**	....	**263**	**329**	....	**364**
		Torque	**30.1**	....	**47.5**	....	**58.4**	**73.0**	....	**82.0**
7.59	230	Mechanical Hp	**112**	....	**181**	....	**238**	**298**	....	**355**
		Torque	**30.9**	....	**49.4**	....	**65.2**	**81.5**	....	**98.0**
9.30	190	Mechanical Hp	**94.4**	....	**148**	....	**198**	**246**	....	**300**
		Torque	**31.7**	....	**50.0**	....	**65.6**	**82.0**	....	**102**
11.39	155	Mechanical Hp	77.9	....	**125**	....	**161**	**201**	....	**254**
		Torque	32.5	....	**51.0**	....	**66.0**	**82.5**	....	**106**
13.95	125	Mechanical Hp	65.3	....	100	....	132	**165**	....	**210**
		Torque	33.1	....	52.0	....	66.4	**83.0**	....	**108**
17.09	100	Mechanical Hp	53.7	....	85.7	....	111	138	....	**179**
		Torque	33.8	....	53.0	....	68.0	85.0	....	**112**
20.93	84	Mechanical Hp	45.0	....	67.8	....	92.1	115	....	148
		Torque	34.4	....	50.0	....	69.3	86.7	....	114
25.63	68	Mechanical Hp	38.4	....	59.3	....	73.0	91.3	....	123
		Torque	34.9	....	45.6	....	68.0	85.0	....	117
31.39	56	Mechanical Hp	....	33.3	....	48.0	....	71.0	82.9	103
		Torque	....	38.5	....	55.3	....	81.0	96.0	120

① AGMA ratios ± 4%.

Note: Horsepower and torque ratings shown in bold type are limited by thermal capacity if the reducer is operated continuously for more than three hours. See thermal horsepower capacity table on page 5.

Note: For input speeds higher than 1750 rpm, refer to Westinghouse.

1430 Rpm Input – 38.44 to 194.6 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 21D	21T	32D	32T	43D	32Q ②	43T	43Q ②	54D	54T	54Q ②
38.44	37	Mechanical Hp	2.84	3.77	4.35	5.77	6.45	....	8.85	....	11.4	15.3	....
		Torque	4.7	6.4	7.2	9.8	10.8	....	15.2	....	19.2	27.1	....
47.08	30	Mechanical Hp	....	3.15	....	4.84			7.41	....	....	13.2	....
		Torque	....	6.5	....	10.0	....	....	15.5	....	....	27.4	....
57.66	25	Mechanical Hp	....	2.55	....	3.92	....	....	6.09	....	....	10.9	....
		Torque	....	6.5	....	10.0	....	....	15.7	....	....	27.7	....
70.62	20	Mechanical Hp	....	2.03	....	3.12	....	....	4.91	....	....	8.93	....
		Torque	....	6.5	....	10.0	....	....	15.9	....	....	28.0	....
86.50	16.5	Mechanical Hp	....	1.71	....	2.65	....	....	4.08	....	....	7.07	....
		Torque	....	6.7	....	10.4	....	....	16.2	....	....	28.2	....
105.9	13.5	Mechanical Hp	....	1.47	....	2.28	....	....	3.52	....	....	6.00	....
		Torque	....	6.8	....	10.6	....	....	16.5	....	....	28.4	....
129.7	11.0	Mechanical Hp	....	1.29	....	1.94	....	....	2.96	....	....	5.05	....
		Torque	....	7.2	....	10.9	....	....	16.8	....	....	28.6	....
158.9	9.0	Mechanical Hp	....	.735	....	1.09	....	....	1.81	....	....	4.14	....
		Torque	....	5.1	....	7.6	....	....	12.7	....	....	28.7	....
194.6	7.5	Mechanical Hp	....	.621	....	922	....	1.27	1.51	2.08	....	2.66	3.32
		Torque	....	5.2	....	7.7	....	11.1	12.8	18.3	....	22.5	28.9

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 64T	64Q ②	76T	76Q ②	88D	K88T	88T	92D	88Q ②	92T
38.44	37	Mechanical Hp	22.5	....	34.5	....	49.3	....	....	74.0	....	....
		Torque	39.5	....	58.7	....	82.5	....	....	126	....	....
47.08	30	Mechanical Hp	19.4	....	28.9	....	....	38.0	47.5	....	....	61.0
		Torque	40.0	....	60.0	....	....	80.8	101	....	....	132
57.66	25	Mechanical Hp	15.7	....	23.7	....	....	31.8	39.7	....	....	52.0
		Torque	40.4	....	60.7	....	....	81.6	102	....	....	134
70.62	20	Mechanical Hp	13.1	....	19.7	....	....	26.3	32.9	....	....	42.4
		Torque	40.9	....	61.1	....	....	82.4	103	....	....	135
86.50	16.5	Mechanical Hp	10.4	....	15.6	....	....	21.6	27.0	....	....	34.7
		Torque	41.2	....	61.5	....	....	83.2	104	....	....	136
105.9	13.5	Mechanical Hp	8.65	....	13.5	....	....	18.0	22.5	....	....	28.8
		Torque	41.5	....	63.0	....	....	84.0	105	....	....	137
129.7	11.0	Mechanical Hp	7.30	....	11.6	....	....	14.3	17.9	....	....	23.0
		Torque	41.8	....	65.3	....	....	84.8	106	....	....	139
158.9	9.0	Mechanical Hp	6.12	....	9.57	....	....	12.2	15.2	....	17.1	19.7
		Torque	42.1	....	66.5	....	....	85.6	107	....	123	141
194.6	7.5	Mechanical Hp	....	4.81	....	7.79	....	....	11.5	....	13.9	16.6
		Torque	....	42.3	....	68.9	....	....	97.7	....	124	143

1430 Rpm Input – 238.4 to 985.3 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 5%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 32Q	43Q	54T ①	54Q	64Q	76Q	88T ①	88Q	92T ①
238.4	6.0	Mechanical Hp	1.27	1.73	2.18	2.70	3.98	6.67	11.5	11.0	13.6
		Torque	11.2	18.4	22.6	29.0	42.6	69.3	97.8	124	145
291.9	5.0	Mechanical Hp	1.06	1.42	....	2.16	3.24	5.36	....	9.58	....
		Torque	11.2	18.4	....	29.2	42.8	69.6	....	125	....
357.5	4.0	Mechanical Hp	.717	1.16	....	1.77	2.59	4.45	....	7.96	....
		Torque	11.3	18.5	....	29.3	43.0	70.0	....	126	....
437.9	3.2	Mechanical Hp	.571	.928	....	1.50	2.12	3.54	....	6.31	....
		Torque	11.3	18.6	....	29.4	43.1	70.3	....	126	....
536.3	2.7	Mechanical Hp	.466	.758	....	1.24	1.80	2.91	....	5.21	....
		Torque	11.3	18.6	....	29.4	43.3	70.5	....	127	....
656.8	2.2	Mechanical Hp	.394	.644	....	.832	1.50	2.45	....	4.37	....
		Torque	11.3	18.7	....	24.3	43.4	70.8	....	127	....
804.5	1.8	Mechanical Hp	.329	.534	....	.690	....	2.04	....	3.64	....
		Torque	11.4	18.7	....	24.3	....	71.0	....	127	....
985.3	1.5	Mechanical Hp	.265	.431	....	....	....	....	....	2.36	....
		Torque	11.4	18.7	....	....	....	....	....	103	....

① AGMA ratios ± 4%.
② AGMA ratios ± 5%.

Note: For reversing duty on quadruple reduction units, refer to Westinghouse.

1170 Rpm Input – 1.25 to 4.13 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 3%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size												
			10S	21S	32S	10D ①	43S	21D ①	54S	32D ①	43D ①	76S	54D ①	76D ①	88D ①
1.225	950	Mechanical Hp	8.62	13.3	19.5	....	35.6	....	54.9	....	....	**108**	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	**7.45**	....	....	....
1.500	780	Mechanical Hp	7.13	10.5	15.7	....	29.5	....	46.1	....	....	90.1	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
1.837	640	Mechanical Hp	5.86	9.03	13.4	....	24.2	....	37.3	....	....	74.0	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
2.250	520	Mechanical Hp	4.75	7.40	10.7	....	19.6	....	30.3	....	....	60.0	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
2.756	420	Mechanical Hp	3.78	5.96	8.86	....	16.2	....	25.0	....	....	49.5	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
3.375	350	Mechanical Hp	3.09	4.69	7.03	....	12.7	....	19.7	....	....	39.0	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
4.134	280	Mechanical Hp	2.61	3.95	5.76	12.1	10.8	18.0	16.6	37.3	40.4	32.6	**79.1**	**213**	**330**
		Torque	.59	.90	1.34	2.7	2.44	4.2	3.76	8.3	9.0	7.45	**17.6**	**47.5**	**73.0**

1170 Rpm Input – 5.06 to 31.39 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size								
			10D	21D	21T	32D	32T	43D	43T	54D	54T
5.06	230	Mechanical Hp	11.9	18.6	....	30.1	....	39.6	....	**76.3**	....
		Torque	3.3	5.1	....	8.4	....	11.0	....	**21.2**	....
6.20	190	Mechanical Hp	10.1	16.2	....	24.9	....	39.7	....	66.0	....
		Torque	3.4	5.6	....	8.6	....	13.3	....	21.8	....
7.59	155	Mechanical Hp	8.35	14.1	....	21.7	....	33.1	....	54.4	....
		Torque	3.4	5.7	....	8.8	....	13.5	....	22.2	....
9.30	125	Mechanical Hp	6.97	11.7	....	17.6	....	27.2	....	45.1	....
		Torque	3.5	5.8	....	8.9	....	13.7	....	22.7	....
11.39	100	Mechanical Hp	5.55	9.34	....	14.3	....	22.9	....	37.7	....
		Torque	3.5	5.7	....	8.8	....	14.0	....	23.0	....
13.95	84	Mechanical Hp	4.27	6.83	....	10.7	....	18.3	....	30.2	....
		Torque	3.3	5.3	....	8.3	....	14.2	....	23.4	....
17.09	68	Mechanical Hp	3.39	5.31	....	8.06	....	14.8	....	26.0	....
		Torque	3.1	4.9	....	7.6	....	13.6	....	23.8	....
20.93	56	Mechanical Hp	2.90	4.54	....	7.01	....	12.6	....	21.8	....
		Torque	3.2	5.0	....	7.9	....	14.0	....	24.1	....
25.63	45	Mechanical Hp	1.82	3.33	....	5.18	....	7.82	....	13.8	....
		Torque	2.5	4.6	....	7.0	....	10.7	....	19.0	....
31.39	37	Mechanical Hp	1.51	2.84	3.73	4.27	5.70	6.54	8.74	11.6	15.7
		Torque	2.5	4.7	6.4	7.2	9.8	10.8	15.2	19.2	27.1

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size						
			64D	64T	76D	76T	K88D	88D	92D
5.06	230	Mechanical Hp	**114**	....	**178**	....	**240**	**301**	....
		Torque	**30.9**	....	**49.4**	....	**65.2**	**81.5**	....
6.20	190	Mechanical Hp	**93.9**	....	**149**	....	**197**	**247**	**302**
		Torque	**31.7**	....	**50.0**	....	**65.6**	**82.0**	**102**
7.59	155	Mechanical Hp	79.2	....	**125**	....	**161**	**202**	**257**
		Torque	32.5	....	**51.0**	....	**66.0**	**82.5**	**106**
9.30	125	Mechanical Hp	65.9	....	**103**	....	132	**166**	**212**
		Torque	33.1	....	**52.0**	....	66.4	**83.0**	**108**
11.39	100	Mechanical Hp	54.2	....	87.0	....	111	139	**179**
		Torque	33.8	....	53.0	....	68.0	85.0	**112**
13.95	84	Mechanical Hp	45.3	....	64.7	....	92.0	115	148
		Torque	34.4	....	50.0	....	69.4	86.7	114
17.09	68	Mechanical Hp	37.0	....	49.3	....	74.7	93.4	125
		Torque	34.9	....	45.6	....	68.4	85.5	117
20.93	56	Mechanical Hp	31.0	....	43.3	....	63.8	79.7	104
		Torque	35.5	....	47.8	....	71.8	89.7	120
25.63	45	Mechanical Hp	26.4	....	36.9	....	49.4	61.7	87.4
		Torque	35.9	....	50.0	....	68.8	86.0	124
31.39	37	Mechanical Hp	....	22.8	....	34.0	....	48.4	72.6
		Torque	....	39.5	....	58.7	....	82.5	126

① AGMA ratios ± 4%.

Note: Horsepower and torque ratings shown in bold type are limited by thermal capacity if the reducer is operated continuously for more than three hours. See thermal horsepower capacity table on page 5.

1170 Rpm Input – 38.44 to 194.6 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size										
			21D	21T	32D	32T	43D	32Q ②	43T	43Q ②	54D	54T	54Q ②
38.44	30	Mechanical Hp	2.37	3.14	3.61	4.82	5.32	....	7.38	....	9.48	12.6	....
		Torque	4.8	6.5	7.3	10.0	10.9	....	15.5	....	19.4	27.4	....
47.08	25	Mechanical Hp	....	2.57	....	3.96	....	....	6.14	....	....	10.9	....
		Torque	....	6.5	....	10.0	....	....	15.7	....	....	27.7	....
57.66	20	Mechanical Hp	....	2.09	....	3.21	....	....	5.04	....	....	9.06	....
		Torque	....	6.5	....	10.0	....	....	15.9	....	....	28.0	....
70.62	16.5	Mechanical Hp	....	1.71	....	2.66	....	....	4.09	....	....	7.35	....
		Torque	....	6.7	....	10.4	....	....	16.2	....	....	28.2	....
86.50	13.5	Mechanical Hp	....	1.42	....	2.21	....	....	3.40	....	....	5.82	....
		Torque	....	6.8	....	10.6	....	....	16.5	....	....	28.4	....
105.9	11.0	Mechanical Hp	....	1.27	....	1.92	....	....	2.93	....	....	4.94	....
		Torque	....	7.2	....	10.9	....	....	16.8	....	....	28.6	....
129.7	9.0	Mechanical Hp	....	1.05	....	1.63	....	....	2.47	....	....	4.15	....
		Torque	....	7.2	....	11.2	....	....	17.1	....	....	28.7	....
158.9	7.5	Mechanical Hp	....	.602	....	.909	....	....	1.46	....	....	3.40	....
		Torque	....	5.1	....	7.7	....	....	12.6	....	....	28.8	....
194.6	6.0	Mechanical Hp	....	.499	....	.754	....	1.05	1.23	1.71	....	2.18	2.72
		Torque	....	5.1	....	7.7	....	11.2	12.8	18.4	....	22.6	29.0

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size									
			64T	64Q ②	76T	76Q ②	88D	K88T	88T	92D	88Q ②	92T
38.44	30	Mechanical Hp	18.6	....	28.8	....	40.6	....	....	62.5	....	....
		Torque	40.0	....	60.0	....	83.0	....	....	130	....	....
47.08	25	Mechanical Hp	16.0	....	23.9	....	....	31.4	39.3	....	....	50.7
		Torque	40.4	....	60.7	....	....	81.6	102	....	....	134
57.66	20	Mechanical Hp	13.0	....	19.5	....	....	26.2	32.8	....	....	42.9
		Torque	40.9	....	61.1	....	....	82.4	103	....	....	135
70.62	16.5	Mechanical Hp	10.8	....	16.2	....	....	21.8	27.2	....	....	35.0
		Torque	41.2	....	61.5	....	....	83.2	104	....	....	136
86.50	13.5	Mechanical Hp	8.64	....	13.1	....	....	17.8	22.3	....	....	28.6
		Torque	41.5	....	63.0	....	....	84.0	105	....	....	137
105.9	11.0	Mechanical Hp	7.13	....	11.5	....	....	14.8	18.5	....	....	23.7
		Torque	41.8	....	65.3	....	....	84.8	106	....	....	138
129.7	9.0	Mechanical Hp	6.00	....	9.70	....	....	11.8	14.7	....	....	19.1
		Torque	42.0	....	66.5	....	....	85.6	107	....	....	141
158.9	7.5	Mechanical Hp	5.03	....	7.65	....	....	10.0	12.5	....	14.1	16.4
		Torque	42.3	....	65.0	....	....	85.6	107	....	124	143
194.6	6.0	Mechanical Hp	....	3.96	....	6.41	....	....	9.47	....	11.4	13.7
		Torque	....	42.6	....	69.3	....	....	97.8	....	124	145

1170 Rpm Input – 238.4 to 985.3 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 5%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size								
			32Q	43Q	54T ①	54Q	64Q	76Q	88T ①	88Q	92T ①
238.4	5.0	Mechanical Hp	.872	1.41	1.78	2.22	3.27	5.48	7.64	9.79	11.2
		Torque	11.2	18.4	22.6	29.2	42.8	69.6	97.8	125	146
291.9	4.0	Mechanical Hp	.723	1.17	....	1.77	2.66	4.41	....	7.90	....
		Torque	11.3	18.5	....	29.3	43.0	70.0	....	126	....
357.5	3.2	Mechanical Hp	.586	.954	....	1.45	2.12	3.65	....	6.51	....
		Torque	11.3	18.6	....	29.4	43.1	70.3	....	126	....
437.9	2.7	Mechanical Hp	.467	.759	....	1.23	1.74	2.90	....	5.21	....
		Torque	11.3	18.6	....	29.4	43.3	70.5	....	127	....
536.3	2.2	Mechanical Hp	.381	.624	....	1.02	1.48	2.39	....	4.26	....
		Torque	11.3	18.7	....	29.5	43.4	70.8	....	127	....
656.8	1.8	Mechanical Hp	.325	.527	....	.681	1.23	2.01	....	3.57	....
		Torque	11.4	18.7	....	24.3	43.6	71.0	....	127	....
804.5	1.5	Mechanical Hp	.269	.437	....	.567	....	1.68	....	2.97	....
		Torque	11.4	18.7	....	24.4	....	71.2	....	127	....
985.3	1.2	Mechanical Hp	.217	.352	....	....	....	....	....	1.93	....
		Torque	11.4	18.7	....	....	....	....	....	103	....

① AGMA ratios ± 4%.
② AGMA ratios ± 5%.

Note: For reversing duty on quadruple reduction units, refer to Westinghouse.

870 Rpm Input – 1.25 to 4.13 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 3%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size												
			10S	21S	32S	10D ①	43S	21D ①	54S	32D ①	43D ①	76S	54D ①	76D ①	88D ①
1.225	700	Mechanical Hp	6.41	9.90	14.5	....	26.5	....	40.8	....	....	80.9	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
1.500	580	Mechanical Hp	5.30	7.87	11.7	....	21.9	....	34.3	....	....	67.0	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
1.837	470	Mechanical Hp	4.36	6.71	9.98	....	18.0	....	27.7	....	....	55.0	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
2.250	390	Mechanical Hp	3.53	5.50	7.99	....	14.6	....	22.5	....	....	44.6	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
2.756	320	Mechanical Hp	2.81	4.43	6.59	....	12.0	....	18.5	....	....	36.8	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
3.375	260	Mechanical Hp	2.30	3.49	5.23	....	9.51	....	14.6	....	....	29.0	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
4.134	210	Mechanical Hp	1.94	2.94	4.28	10.7	8.04	18.7	12.3	28.4	40.4	24.2	**71.8**	**170**	**163**
		Torque	.59	.90	1.34	3.2	2.44	5.6	3.76	8.5	12.1	7.45	**21.5**	**50.9**	**48.6**

870 Rpm Input – 5.06 to 31.39 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size							
			10D	21D	21T	32D	32T	43D	43T	54D	54T
5.06	175	Mechanical Hp	8.86	15.4	....	23.2	....	36.4	....	58.9	....
		Torque	3.3	5.7	....	8.7	....	13.6	....	22.0	....
6.20	140	Mechanical Hp	7.56	12.5	....	19.2	....	31.7	....	50.4	....
		Torque	3.4	5.8	....	8.9	....	14.3	....	22.4	....
7.59	115	Mechanical Hp	6.39	10.6	....	16.5	....	26.6	....	41.5	....
		Torque	3.5	5.8	....	9.0	....	14.6	....	22.8	....
9.30	95	Mechanical Hp	5.18	8.91	....	13.3	....	21.8	....	34.3	....
		Torque	3.5	5.9	....	9.1	....	14.8	....	23.2	....
11.39	77	Mechanical Hp	4.24	7.31	....	11.1	....	18.2	....	28.7	....
		Torque	3.6	6.0	....	9.2	....	15.0	....	23.6	....
13.95	62	Mechanical Hp	3.47	5.84	....	9.04	....	14.7	....	23.0	....
		Torque	3.6	6.1	....	9.4	....	15.3	....	24.0	....
17.09	50	Mechanical Hp	2.85	4.92	....	7.49	....	12.5	....	19.7	....
		Torque	3.5	6.1	....	9.5	....	15.4	....	24.3	....
20.93	42	Mechanical Hp	2.22	4.18	....	6.27	....	10.5	....	16.5	....
		Torque	3.3	6.2	....	9.5	....	15.6	....	24.6	....
25.63	34	Mechanical Hp	1.40	2.63	....	5.28	....	8.53	....	13.5	....
		Torque	2.59	4.9	....	9.6	....	15.7	....	24.9	....
31.39	28	Mechanical Hp	1.17	2.12	3.03	3.18	4.33	4.95	7.52	8.78	11.95
		Torque	2.61	4.71	7.0	7.2	10.0	11.0	17.5	19.5	27.6

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size						
			64D	64T	76D	76T	K88D	88D	92D
5.06	175	Mechanical Hp	**87.9**	....	**140**	....	128	**161**	....
		Torque	**32.0**	....	**52.3**	....	46.8	**58.5**	....
6.20	140	Mechanical Hp	72.2	....	**118**	....	131	**164**	**180**
		Torque	32.8	....	**53.4**	....	58.4	**73.0**	**82.0**
7.59	115	Mechanical Hp	60.5	....	**99.4**	....	123	**154**	**176**
		Torque	33.4	....	**54.5**	....	68	**85.0**	**98.0**
9.30	95	Mechanical Hp	50.3	....	82.3	....	101	127	**164**
		Torque	34.0	....	55.6	....	68.4	85.5	**112**
11.39	77	Mechanical Hp	41.3	....	68.9	....	84	105	136
		Torque	34.7	....	56.5	....	69.2	86.5	114
13.95	62	Mechanical Hp	34.5	....	55.4	....	68.8	86.1	113
		Torque	35.2	....	57.6	....	69.6	87.0	117
17.09	50	Mechanical Hp	28.2	....	46.9	....	56.9	71.1	95.7
		Torque	35.8	....	58.3	....	70.0	87.5	120
20.93	42	Mechanical Hp	23.5	....	39.7	....	46.5	58.1	80.4
		Torque	36.2	....	59.0	....	70.4	88.0	124
25.63	34	Mechanical Hp	20.0	....	32.8	....	37.8	47.2	66.0
		Torque	36.6	....	59.8	....	70.8	88.5	126
31.39	28	Mechanical Hp	....	17.2	....	25.4	....	37.3	55.7
		Torque	....	40.2	....	59.0	....	85.5	130

① AGMA ratios ± 4%.

Note: Horsepower and torque ratings shown in bold type are limited by thermal capacity if the reducer is operated continuously for more than three hours. See thermal horsepower capacity table on page 5.

870 Rpm Input – 38.44 to 194.6 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 21D	21T	32D	32T	43D	32Q ②	43T	43Q ②	54D	54T	54Q ②
38.44	22	Mechanical Hp	1.78	2.51	2.68	3.69	4.03	....	6.27	....	7.16	9.60	....
		Torque	4.85	7.0	7.3	10.3	11.1	....	17.7	....	19.7	27.9	....
47.08	18	Mechanical Hp	....	2.09	....	3.09	....	....	5.18	....	....	8.22	....
		Torque	....	7.1	....	10.5	....	....	17.8	....	....	28.0	....
57.66	15	Mechanical Hp	....	1.69	....	2.50	....	....	4.25	....	....	6.81	....
		Torque	....	7.1	....	10.5	....	....	18.0	....	....	28.3	....
70.62	12.5	Mechanical Hp	....	1.35	....	2.01	....	....	3.40	....	....	5.53	....
		Torque	....	7.1	....	10.6	....	....	18.1	....	....	28.5	....
86.50	10	Mechanical Hp	....	1.12	....	1.66	....	....	2.79	....	....	4.38	....
		Torque	....	7.2	....	10.7	....	....	18.2	....	....	28.7	....
105.9	8.3	Mechanical Hp	....	.947	....	1.45	....	....	2.37	....	....	3.70	....
		Torque	....	7.2	....	11.1	....	....	18.3	....	....	28.8	....
129.7	6.8	Mechanical Hp	....	.785	....	1.21	....	....	1.97	....	....	3.11	....
		Torque	....	7.2	....	11.2	....	....	18.4	....	....	29.0	....
158.9	5.5	Mechanical Hp	....	.456	....	.684	....	....	1.12	....	....	2.55	....
		Torque	....	5.2	....	7.8	....	....	13.0	....	....	29.1	....
194.6	4.5	Mechanical Hp	....	.378	....	.568	....	.783	.934	1.27	....	1.64	2.04
		Torque	....	5.2	....	7.8	....	11.2	13.0	18.4	....	22.8	29.2

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 64T	64Q ②	76T	76Q ②	88D	K88T	88T	92D	88Q ●	92T
38.44	22	Mechanical Hp	14.1	....	22.5	....	31.1	....	....	47.5	....	....
		Torque	40.7	....	63.0	....	85.5	....	....	133	....	....
47.08	18	Mechanical Hp	12.1	....	18.5	....	....	23.8	29.7	....	....	37.9
		Torque	41.0	....	63.0	....	....	83.2	104	....	....	135
57.66	15	Mechanical Hp	9.78	....	15.0	....	....	19.9	24.9	....	....	32.1
		Torque	41.3	....	63.0	....	....	84.0	105	....	....	136
70.62	12.5	Mechanical Hp	8.12	....	12.5	....	....	16.5	20.6	....	....	26.2
		Torque	41.6	....	64.0	....	....	84.8	106	....	....	137
86.50	10	Mechanical Hp	6.50	....	10.0	....	....	13.4	16.7	....	....	21.5
		Torque	42.0	....	65.0	....	....	84.8	106	....	....	139
105.9	8.3	Mechanical Hp	5.35	....	8.64	....	....	11.1	13.9	....	....	18.0
		Torque	42.2	....	66.0	....	....	85.6	107	....	....	141
129.7	6.8	Mechanical Hp	4.51	....	7.27	....	....	8.88	11.1	....	....	14.4
		Torque	42.5	....	67.0	....	....	86.4	108	....	....	143
158.9	5.5	Mechanical Hp	3.78	....	5.87	....	....	7.50	9.38	....	10.5	12.3
		Torque	42.7	....	67.0	....	....	86.4	108	....	124	145
194.6	4.5	Mechanical Hp	....	2.96	....	4.79	....	....	7.27	....	8.55	10.3
		Torque	....	42.8	....	69.6	....	....	101	....	125	146

870 Rpm Input – 238.4 to 985.3 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 5%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size 32Q	43Q	54T ①	54Q	64Q	76Q	88T ①	88Q	92T ①
238.4	3.8	Mechanical Hp	.654	1.05	1.34	1.66	2.44	4.10	5.86	7.33	8.38
		Torque	11.3	18.5	22.9	29.3	43.0	70.0	101	126	147
291.9	3.0	Mechanical Hp	.537	.874	....	1.32	1.98	3.29	....	5.87	....
		Torque	11.3	18.6	....	29.4	43.1	70.3	....	126	....
357.5	2.5	Mechanical Hp	.436	.709	....	1.08	1.59	2.72	....	4.88	....
		Torque	11.3	18.6	....	29.4	43.3	70.5	....	127	....
437.9	2.0	Mechanical Hp	.347	.568	....	.919	1.30	2.17	....	3.87	....
		Torque	11.3	18.7	....	29.5	43.4	70.8	....	127	....
536.3	1.6	Mechanical Hp	.286	.464	....	.767	1.10	1.78	....	3.17	....
		Torque	11.4	18.7	....	29.7	43.6	71.0	....	127	....
656.8	1.3	Mechanical Hp	.242	.392	....	.508	.918	1.49	....	2.65	....
		Torque	11.4	18.7	....	24.4	43.7	71.2	....	127	....
804.5	1.1	Mechanical Hp	.200	.325	....	.423	....	1.25	....	2.23	....
		Torque	11.4	18.7	....	24.5	....	71.4	....	128	....
985.3	.90	Mechanical Hp	.163	.263	....	....	....	....	....	1.43	....
		Torque	11.5	18.8	....	....	....	....	....	103	....

① AGMA ratios ± 4%.
② AGMA ratios ± 5%.

Note: For reversing duty on quadruple reduction units, refer to Westinghouse.

Note: For input speeds lower than 870 rpm, torque values are the same as for 870 rpm.

Overhung Load Capacities

Moduline reducers provide generous overhung load capacity which is seldom exceeded; however, when a pulley, sprocket or pinion is to be mounted on the input or output shaft, the overhung load capacity of the reducer must be checked.

The overhung load capacities listed in the tables below are calculated for a sprocket, pinion or pulley mounted with the centerline of its face at the midpoint of the input or output shaft extension.

If the sprocket, pinion or pulley is to be mounted at a location other than the above, use the following formula to calculate the overhung load on the shaft after selecting appropriate L_c and L_f factors from the tables below.

If the calculated overhung load for the reducer selected exceeds the capacity listed in the table below, select the next larger reducer.

Overhung Load Formula

$$OHL\ (lbs) = \frac{\text{motor hp} \times 126{,}000 \times L_c}{\text{output rpm} \times \text{pitch diameter (inches)} \times L_f}$$

Load Connection Factor, L_c

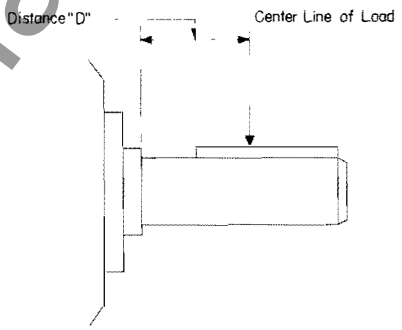
Type of Connection	Factor, L_c
Sprocket	1.00
Pinion	1.25
V-Belt	1.50
Flat Belt	2.50

Load Location Factor, L_f

Shaft Dia. Inches	"D" – Distance From Center Line of Load to Reducer Shaft Shoulder, Inches															
	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5
.875	1.06	.90	.77	.68	....	....	....	....	...	...	...	...	...	...	...	...
1.125	1.12	.98	.83	.74	....	....	....	....	...	...	...	...	...	...	...	...
1.375	1.15	1.03	.91	.79	.73	....	....	....	...	...	...	...	...	...	...	...
1.500	1.17	1.06	.94	.83	.76	.70	....	....	...	...	...	...	...	...	...	...
1.625	1.18	1.08	.97	.86	.78	.73	.68	....	...	...	...	...	...	...	...	...
1.875	1.22	1.13	1.04	.94	.85	.78	.74	.69	...	...	...	...	...	...	...	...
2.125	1.23	1.14	1.06	.96	.88	.80	.76	.71	.67	...	...	...	...	...	...	...
2.375	1.24	1.17	1.09	1.01	.94	.85	.79	.75	.71	.67	...	...	...	...	...	...
2.625	1.25	1.18	1.11	1.04	.97	.89	.82	.77	.74	.70	.67	...	...	...	...	...
3.125	1.25	1.22	1.15	1.09	1.04	.97	.91	.85	.79	.76	.73	.70	...	...	...	...
3.625	1.25	1.24	1.18	1.13	1.08	1.02	.97	.91	.86	.80	.78	.75	.72	.69	...	...
4.500	1.25	1.25	1.23	1.18	1.14	1.08	1.04	1.00	.96	.92	.87	.83	.79	.77	.74	.72
5.000	1.25	1.25	1.24	1.20	1.16	1.12	1.07	1.04	.99	.95	.91	.87	.83	.79	.77	.75

Shaft Diameters

Gear Size	Output		Input			
	Single	Double, Triple & Quadruple	Single	Double	Triple	Quadruple
10	1.125	1.375	.875	.875	.....	.....
21	1.500	1.625	1.125	1.125	.875	.....
32	2.125	1.875	1.375	1.375	.875	.875
43	2.125	2.125	1.625	1.625	1.125	.875
54	2.375	2.625	1.625	1.625	1.375	.875
64	.....	3.125	.....	1.875	1.375	.875
76	2.375	3.625	1.625	2.125	1.625	1.125
K88	.....	4.500	.....	2.125	1.625	1.125
88	.....	4.500	.....	2.125	1.625	1.125
92	.....	5.000	.....	2.125	1.625	.....



Input Shafts, Allowable Overhung Load Capacities

Input Rpm	Unit Size									
	10	21	32	43	54	64	76	K88	88	92
Single and Double Reduction										
1750	150	200	250	350	500	575	650	650	650	700
1430	160	210	265	370	530	615	700	700	700	740
1170	170	230	290	400	570	655	740	740	740	800
870	185	250	320	430	620	710	800	800	800	870
720	195	260	340	460	650	750	850	850	850	910
580	210	280	360	490	700	800	900	900	900	980
Triple Reduction										
1750	...	150	150	200	250	250	350	350	350	500
1430	...	160	160	210	265	265	370	370	370	530
1170	...	170	170	230	290	290	400	400	400	570
870	...	185	185	250	320	320	430	430	430	620
720	...	195	195	260	340	340	460	460	460	650
580	...	210	210	280	360	360	490	490	490	700
Quadruple Reduction										
1750	...	...	150	150	150	150	200	...	200	...
1430	...	...	160	160	160	160	210	...	210	...
1170	...	...	170	170	170	170	230	...	230	...
870	...	...	185	185	185	185	250	...	250	...
720	...	...	195	195	195	195	260	...	260	...
580	...	...	210	210	210	210	280	...	280	...

Example

A belt conveyor is to be driven by a 5 hp motor coupled to a size 21D Moduline reducer, 280 rpm output using a 4" diameter V-belt sheave on the output shaft. The output shaft diameter on a size 21D is 1.625 inches. The centerline of the load is to be placed 1.5 inches from the shaft shoulder.

Procedure – Calculate overhung load

$L_c = 1.50$ and $L_f = 1.08$

$$OHL = \frac{5 \times 126{,}000 \times 1.50}{280 \times 4 \times 1.08} = 781 \text{ lbs.}$$

Refer to overhung load table on page 15. Since the overhung load capacity of the gear size 21D at 280 rpm is 1420 lbs., the gear unit has ample capacity.

Output Shaft – Overhung Load and Thrust Capacities Single Reduction

Gear Size	Pounds	Output Rpm								
		1400	1165	950	780	640	520	420	350	280
10S	Overhung Load	300	320	360	400	420	450	500	540	580
	Thrust (Down or Out)	130	190	270	340	400	475	525	590	600
	Thrust (Up or In)	130	190	270	340	400	475	525	590	600
21S	Overhung Load	650	720	800	860	930	1000	1075	1140	1200
	Thrust (Down or Out)	540	630	770	880	1000	1120	1160	1190	1210
	Thrust (Up or In)	540	630	770	880	1000	1120	1160	1190	1210
32S	Overhung Load	900	980	1075	1150	1250	1360	1490	1500	1500
	Thrust (Down or Out)	950	1090	1200	1200	1200	1200	1200	1200	1200
	Thrust (Up or In)	950	1090	1200	1200	1200	1200	1200	1200	1200
43S	Overhung Load	920	1000	1080	1170	1180	1300	1400	1500	1500
	Thrust (Down or Out)	500	675	825	900	900	900	900	900	900
	Thrust (Up or In)	500	675	825	900	900	900	900	900	900
54S	Overhung Load	1000	1000	1000	1000	1000	1050	1090	1180	1200
	Thrust (Down or Out)	775	775	775	775	775	775	775	775	775
	Thrust (Up or In)	775	775	775	775	775	775	775	775	775
76S	Overhung Load	1000	1000	1000	1000	1000	1000	1000	1025	1100
	Thrust (Down or Out)	775	775	775	775	775	775	775	775	775
	Thrust (Up or In)	775	775	775	775	775	775	775	775	775

Output Shaft – Overhung Load and Thrust Capacities Double, Triple and Quadruple Reduction

Gear Size	Pounds	Output Rpm												
		420	350	280	230	190	155	125	100	84	68	56	45	37 and Below
10	Overhung Load	1000	1100	1160	1240	1320	1400	1500	1600	1700	1700	1700	1700	.....
	Thrust (Down or Out)	860	920	1000	1050	1130	1210	1300	1400	1500	1600	1720	1850	.....
	Thrust (Up or In)	700	760	820	880	930	1000	1070	1150	1230	1320	1400	1500	.....
21	Overhung Load	1260	1330	1420	1500	1600	1700	1800	1930	2020	2150	2300	2300	2300
	Thrust (Down or Out)	1220	1300	1400	1500	1600	1720	1850	2000	2110	2260	2420	2600	2600
	Thrust (Up or In)	1000	1060	1150	1230	1300	1400	1500	1620	1720	1850	1970	2120	2200
32	Overhung Load	1600	1690	1800	1920	2020	2150	2300	2450	2580	2750	2900	3000	3000
	Thrust (Down or Out)	1640	1750	1880	2000	2150	2300	2470	2660	2820	3020	3250	3500	3500
	Thrust (Up or In)	1430	1520	1640	1750	1870	2000	2150	2320	2450	2630	2810	3000	3000
43	Overhung Load	1950	2050	2200	2340	2480	2620	2800	3000	3150	3370	3570	3800	4000
	Thrust (Down or Out)	2270	2420	2600	2800	2950	3200	3400	3700	3900	4200	4500	4800	5000
	Thrust (Up or In)	2000	2150	2320	2470	2640	2800	3050	3270	3460	3710	3950	4300	4500
54	Overhung Load	3450	3680	3920	4180	4400	4700	5000	5000	5000	5000	5000	5000	5000
	Thrust (Down or Out)	3600	3850	4150	4400	4700	5000	5400	5800	6150	6600	7000	7400	7400
	Thrust (Up or In)	2850	3000	3260	3500	3740	4000	4300	4650	4950	5300	5650	6100	6200
64	Overhung Load	.....	4400	4700	5000	5300	5600	6000	6400	6750	7200	7600	8000	8000
	Thrust (Down or Out)	.....	4600	5000	5300	5700	6000	6500	7000	7400	7900	8500	9000	9000
	Thrust (Up or In)	.....	3600	3900	4200	4500	4800	5200	5600	5900	6400	6800	7300	7500
76	Overhung Load	5200	5450	5850	6200	6600	7000	7450	8000	8400	8950	9500	10000	10000
	Thrust (Down or Out)	5050	5350	5750	6150	6550	7000	7500	8100	8550	9150	9800	10500	11000
	Thrust (Up or In)	4100	4350	4700	5000	5350	5750	6200	6650	7100	7600	8100	8700	9000
K88	Overhung Load	10000	10500	11250	12000	13000	14500	15250	16500	17750	19250	20000	20000	20000
	Thrust (Down or Out)	9500	10000	10750	11500	12500	13500	14750	16250	17500	20000	20000	20000	20000
	Thrust (Up or In)	9500	10000	10750	11500	12500	13500	14750	16250	17500	20000	20000	20000	20000
88	Overhung Load	10000	10500	11250	12000	13000	14500	15250	16500	17750	19250	20000	20000	20000
	Thrust (Down or Out)	9500	10000	10750	11500	12500	13500	14750	16250	17500	20000	20000	20000	20000
	Thrust (Up or In)	9500	10000	10750	11500	12500	13500	14750	16250	17500	20000	20000	20000	20000
92	Overhung Load	.....	.....	12000	12800	13800	14800	16000	17400	18500	20000	21500	22500	22500
	Thrust (Down or Out)	.....	.....	14000	15000	15800	16900	18000	19500	20500	22000	23400	25000	25000
	Thrust (Up or In)	.....	.....	12750	13600	14500	15500	16500	18000	19000	20500	21500	23000	23000

Note: The thrust capacities published above are for units with pure thrust loads. Refer to Westinghouse when there are combined radial and thrust loads or when loads exceed capacities listed. Indicate direction of rotation of shaft and location and direction of applied load.

Exact Gear Ratios (When special ratios required, specify exact ratio on order)

Single Reduction

Unit Size	AGMA Ratio						
	1.225	1.500	1.837	2.250	2.756	3.375	4.134
10S	1.271①	1.535	1.868	2.303	2.893①	3.542①	4.190
21S	1.255	1.578①	1.850	2.257①	2.800	3.560①	4.227
32S	1.275①	1.578①	1.854	2.314	2.806	3.538①	4.318①
43S	1.271①	1.535	1.868	2.303	2.793	3.542①	4.190
54S	1.271①	1.512	1.868	2.303	2.793	3.542①	4.190
76S	1.271①	1.535	1.868	2.303	2.793	3.542①	4.238

Double Reduction

Unit Size	AGMA Ratio											
	4.13	5.06	6.20	7.59	9.30	11.39	13.95	17.09	20.93	25.63	31.39	38.44
10 D	4.120	5.141	6.209	7.559	9.317	11.70	14.33	16.95	20.45	25.41	30.65	.....
21 D	4.119	5.079	6.386	7.488	9.136	11.33	14.41	17.11	20.45	25.65	30.65	37.54
32 D	4.125	5.169	6.399	7.518	9.386	11.38	14.35	17.51	20.92	25.09	31.25	37.49
43 D	4.128	5.150	6.220	7.572	9.333	11.32	14.35	16.98	20.49	25.40	30.65	37.99
54 D	4.131	5.154	6.130	7.577	9.340	11.33	14.36	16.99	20.50	25.42	30.65	37.99
64 D	.....	5.023	6.269	7.614	9.327	11.58	14.08	17.48	21.22	25.19	.....	.....
76 D	4.125	5.147	6.216	7.567	9.327	11.31	14.34	17.16	20.48	25.15	.....	.....
K88 D	4.099	5.017	6.145	7.575	9.248	11.35	13.94	16.99	20.90	25.85	31.65	37.93
88 D	4.099	5.017	6.145	7.575	9.248	11.35	13.94	16.99	20.90	25.85	31.65	37.93
92 D	.....	.....	6.257	7.658	9.418	11.56	14.24	17.30	21.28	26.33	32.23	38.62

Triple Reduction

Unit Size	AGMA Ratio										
	31.39	38.44	47.08	57.66	70.62	86.50	105.9	129.7	158.9	194.6	238.4
21T	31.83	38.44	46.79	57.68	72.45	88.70	104.9	126.6	157.3	189.8	.....
32T	31.89	38.52	46.89	57.79	72.59	88.87	105.2	126.9	157.3	189.5	.....
43T	32.28	38.98	47.45	58.49	73.47①	89.95	106.4	128.4	159.2	192.1	.....
54T	31.89	40.10①	47.02	57.37	71.16	90.48①	107.4	128.4	157.3	191.9	235.1
64T	32.11	39.75	46.70	58.30	70.70	89.15	108.8	129.9	155.9	.....	.....
76T	31.97	38.61	47.00	57.93	70.25	89.08	105.4	127.2	157.6	.....	.....
K88T	.....	.....	48.20	58.21	70.86	87.35	105.9	134.3	158.9	191.7	237.7
88T	32.16	38.84	48.20	58.21	70.86	87.35	105.9	134.3	158.9	191.7	237.7
92T	.....	.....	49.08①	58.38	72.16	88.95	107.9	136.8①	161.8	195.3	242.0

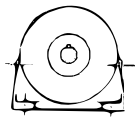
Quadruple Reduction

Unit Size	AGMA Ratio								
	194.6	238.4	291.9	357.5	437.9	536.3	656.8	804.5	985.3
32Q	197.3	238.3	290.1	357.6	449.2	549.9	650.6	785.0	973.0
43Q	199.7	241.2	293.6	361.9	454.6	556.5	658.5	794.4	984.8
54Q	197.6	243.6	305.9	374.5	443.2	534.6	662.5	799.2	.....
64Q	199.4	242.8	299.3	375.9●	460.2●	544.5	656.9	.....	.....
76Q	200.6	235.7	294.3	358.9	450.0	549.1	655.9	786.8	.....
88Q	201.8	237.1	296.1	359.0	452.7	552.4	659.8	791.5	989.0

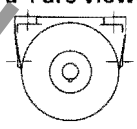
① Exact ratios conform to AGMA ratios within ±3% for single reduction, ±4% for double and triple reduction, and ±5% for quadruple reduction except where indicated with ①.

Further Information
Discounts and Multipliers:
Selling Policy 2900
Price List 2986-3
Dimension Sheets 2986-4

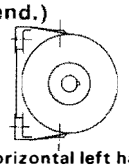
Mounting Positions (Figures 1 thru 4 are viewed from output end.)



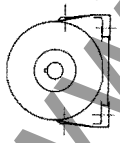
1. Floor mounting



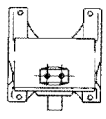
2. Horizontal ceiling mtg.



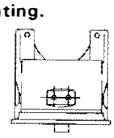
3. Horizontal left hand wall mounting.



4. Horizontal right hand wall mounting.

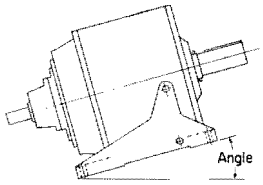


5. Vertical wall mtg. shaft down – refer to Westinghouse.

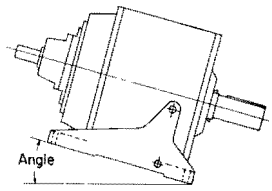


6. Vertical flange mounting shaft down – refer to Westinghouse.

Horizontal Mounting Limits



Output Shaft Up: Maximum 10 degrees. If greater, refer to Westinghouse.



Output Shaft Down: Maximum 15 degrees. If greater, refer to Westinghouse.

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1750 Rpm – 38.44 to 194.6 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ±4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size										
			21D	21T	32D	32T	43D	32Q ②	43T	43Q ②	54D	54T	54Q ②
38.44	45	Mechanical Hp	3.40	4.55	5.26	7.06	7.82	....	10.6	....	13.8	18.6	....
		Torque	4.6	6.3	7.1	9.8	10.7	....	14.9	....	19.0	26.9	....
47.08	37	Mechanical Hp	....	3.79	....	5.80	....	....	8.89	....	....	16.0	....
		Torque	....	6.4	....	9.8	....	....	15.2	....	....	27.1	....
57.66	30	Mechanical Hp	....	3.13	....	4.80	....	....	7.36	....	....	13.2	....
		Torque	....	6.5	....	10.0	....	....	15.5	....	....	27.4	....
70.62	25	Mechanical Hp	....	2.49	....	3.82	....	....	5.93	....	....	10.8	....
		Torque	....	6.5	....	10.0	....	....	15.7	....	....	27.7	....
86.50	20	Mechanical Hp	....	2.03	....	3.12	....	....	4.91	....	....	8.59	....
		Torque	....	6.5	....	10.0	....	....	15.9	....	....	28.0	....
105.9	16.5	Mechanical Hp	....	1.77	....	2.74	....	....	4.22	....	....	7.29	....
		Torque	....	6.7	....	10.4	....	....	16.2	....	....	28.2	....
129.7	13.5	Mechanical Hp	....	1.49	....	2.32	....	....	3.56	....	....	6.14	....
		Torque	....	6.8	....	10.6	....	....	16.5	....	....	28.4	....
158.9	11.0	Mechanical Hp	....	.900	....	1.96	....	....	2.21	....	....	5.05	....
		Torque	....	5.1	....	11.1	....	....	12.7	....	....	28.6	....
194.6	9.0	Mechanical Hp	....	.746	....	1.11	....	1.56	1.83	2.53	....	3.24	4.03
		Torque	....	5.1	....	7.6	....	11.1	12.7	18.2	....	22.4	28.7

AGMA Ratios ±4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size									
			64T	64Q ②	76T	76Q ②	88D	K88T	88T	92D	88Q ②	92T
38.44	45	Mechanical Hp	27.3	....	41.2	....	60.0	....	70.0	89.1	....	....
		Torque	39.1	....	57.3	....	82.0	....	98.0	124	....	....
47.08	37	Mechanical Hp	23.4	....	34.6	....	....	45.6	57.0	....	....	73.5
		Torque	39.5	....	58.7	....	....	79.2	99.0	....	....	130
57.66	30	Mechanical Hp	19.0	....	28.7	....	....	38.5	48.1	....	....	62.8
		Torque	40.0	....	60.0	....	....	80.8	101	....	....	132
70.62	25	Mechanical Hp	15.8	....	24.0	....	....	31.9	39.9	....	....	51.5
		Torque	40.4	....	60.7	....	....	81.6	102	....	....	134
86.50	20	Mechanical Hp	12.7	....	19.0	....	....	26.2	32.7	....	....	42.1
		Torque	40.9	....	61.1	....	....	82.4	103	....	....	135
105.9	16.5	Mechanical Hp	10.5	....	16.2	....	....	21.8	27.2	....	....	35.0
		Torque	41.2	....	61.5	....	....	83.2	104	....	....	136
129.7	13.5	Mechanical Hp	8.87	....	13.7	....	....	17.3	21.7	....	....	27.8
		Torque	41.5	....	63.0	....	....	84.0	105	....	....	137
158.9	11.0	Mechanical Hp	7.44	....	11.4	....	....	14.6	18.3	....	20.7	23.8
		Torque	41.8	....	65.0	....	....	84.0	105	....	122	139
194.6	9.0	Mechanical Hp	....	5.86	....	9.49	....	....	14.2	....	16.9	20.0
		Torque	....	42.1	....	68.6	....	....	98	....	123	141

1750 Rpm Input – 238.4 to 985.3 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ±5%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size								
			32Q	43Q	54T ①	54Q	64Q	76Q	88T ①	88Q	92T ①
238.4	7.5	Mechanical Hp	1.29	2.10	2.65	3.29	4.83	8.11	11.4	14.5	16.4
		Torque	11.1	18.3	22.5	28.9	42.3	68.9	98.0	124	143
291.9	6.0	Mechanical Hp	1.07	1.74	....	2.63	3.95	6.54	....	11.6	....
		Torque	11.2	18.4	....	29.0	42.6	69.3	....	124	....
357.5	5.0	Mechanical Hp	.870	1.41	....	2.16	3.16	5.41	....	9.67	....
		Torque	11.2	18.4	....	29.2	42.8	69.6	....	125	....
437.9	4.0	Mechanical Hp	.698	1.13	....	1.83	2.59	4.32	....	7.73	....
		Torque	11.3	18.5	....	29.3	43.0	70.0	....	126	....
536.3	3.2	Mechanical Hp	.570	.928	....	1.52	2.19	3.55	....	6.33	....
		Torque	11.3	18.6	....	29.4	43.1	70.3	....	126	....
656.8	2.7	Mechanical Hp	.482	.784	....	1.01	1.83	2.98	....	5.34	....
		Torque	11.3	18.6	....	24.3	43.3	70.5	....	127	....
804.5	2.2	Mechanical Hp	.399	.653	....	.844	....	2.49	....	4.45	....
		Torque	11.3	18.7	....	24.3	....	70.8	....	127	....
985.3	1.8	Mechanical Hp	.325	.527	....	....	....	....	....	2.89	....
		Torque	11.4	18.7	....	....	....	....	....	103	....

① AGMA ratios ±4%.
② AGMA ratios ±5%.

Note: For input speeds higher than 1750 rpm, refer to Westinghouse.

Note: For reversing duty on quadruple reduction units, refer to Westinghouse.

1430 Rpm Input – 1.25 to 4.13 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 3%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size												
			10S	21S	32S	10D ①	43S	21D ①	54S	32D ①	43D ①	76S	54D ①	76D ①	88D ①
1.225	1150	Mechanical Hp	10.5	16.2	23.8	....	43.5	....	67.1	....	....	**133**	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	**7.45**	....	....	....
1.500	950	Mechanical Hp	8.72	12.9	19.2	....	36.0	....	56.4	....	....	**110**	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	**7.45**	....	....	....
1.837	780	Mechanical Hp	7.16	11.0	16.4	....	29.6	....	45.6	....	....	90.5	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
2.250	640	Mechanical Hp	5.81	9.0	13.1	....	24.0	....	37.0	....	....	73.4	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
2.756	520	Mechanical Hp	4.62	7.2	10.8	....	19.8	....	30.5	....	....	60.5	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
3.325	420	Mechanical Hp	3.78	5.7	8.59	....	15.6	....	24.0	....	....	47.7	....	....	....
		Torque	.59	.90	1.34	....	2.44	....	3.76	....	....	7.45	....	....	....
4.134	350	Mechanical Hp	3.19	4.8	7.04	12.1	13.2	18.1	20.3	35.7	40.1	39.9	**79.6**	**255**	**323**
		Torque	.59	.90	1.34	2.2	2.44	3.3	3.76	6.5	7.3	7.45	**14.5**	**46.5**	**58.5**

1430 Rpm Input – 5.06 to 31.39 Ratios
Torque Ratings In 1000 Inch-Pounds

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size								
			10D	21D	21T	32D	32T	43D	43T	54D	54T
5.06	280	Mechanical Hp	11.9	18.7	....	36.4	....	39.6	....	**77.5**	....
		Torque	2.7	4.2	....	8.3	....	9.0	....	**17.6**	....
6.20	230	Mechanical Hp	12.0	18.1	....	29.7	....	40.1	....	**78.5**	....
		Torque	3.3	5.1	....	8.4	....	11.0	....	**21.2**	....
7.59	190	Mechanical Hp	10.2	16.9	....	25.9	....	39.8	....	65.3	....
		Torque	3.4	5.6	....	8.6	....	13.3	....	21.8	....
9.30	155	Mechanical Hp	8.28	14.1	....	21.2	....	32.8	....	53.9	....
		Torque	3.4	5.7	....	8.8	....	13.5	....	22.2	....
11.39	125	Mechanical Hp	6.79	11.6	....	17.7	....	27.4	....	45.4	....
		Torque	3.5	5.8	....	8.9	....	13.7	....	22.7	....
13.95	100	Mechanical Hp	5.54	8.97	....	13.9	....	22.1	....	36.3	....
		Torque	3.5	5.7	....	8.8	....	14.0	....	23.0	....
17.09	84	Mechanical Hp	4.41	7.03	....	10.7	....	18.9	....	31.2	....
		Torque	3.3	5.3	....	8.3	....	14.2	....	23.4	....
20.93	68	Mechanical Hp	3.44	5.43	....	8.24	....	15.0	....	26.3	....
		Torque	3.1	4.9	....	7.6	....	13.6	....	23.8	....
25.63	56	Mechanical Hp	2.14	4.15	....	7.05	....	12.0	....	21.6	....
		Torque	2.4	4.7	....	7.8	....	13.5	....	24.2	....
31.39	45	Mechanical Hp	1.85	3.25	4.49	5.08	6.97	7.92	10.4	14.0	19.1
		Torque	2.5	4.4	6.3	7.0	9.8	10.7	14.9	19.0	26.9

AGMA Ratios ± 4%	Approx. L.S. Shaft Rpm	Type of Rating	Gear Unit Size					
			64D	64T	76D	76T	K88D	88D	92D
5.06	280	Mechanical Hp	**136**	....	**209**	....	**264**	**330**	....
		Torque	**30.1**	....	**47.5**	....	**58.4**	**73.0**	....
6.20	230	Mechanical Hp	**111**	....	**180**	....	**240**	**301**	**355**
		Torque	**30.9**	....	**49.4**	....	**65.2**	**81.5**	**98.0**
7.59	190	Mechanical Hp	**94.5**	....	**149**	....	**196**	**245**	**302**
		Torque	**31.7**	....	**50.0**	....	**65.6**	**82.0**	**102**
9.30	155	Mechanical Hp	79.0	....	**124**	....	**161**	**202**	**255**
		Torque	32.5	....	**51.0**	....	**66.0**	**82.5**	**106**
11.39	125	Mechanical Hp	64.8	....	104	....	132	**165**	**212**
		Torque	33.1	....	52.0	....	66.4	**83.0**	**108**
13.95	100	Mechanical Hp	54.4	....	83.8	....	110	138	**178**
		Torque	33.8	....	53.0	....	68.0	85.0	**112**
17.09	84	Mechanical Hp	44.6	....	66.1	....	92.0	115	149
		Torque	34.4	....	50.0	....	69.4	86.7	114
20.93	68	Mechanical Hp	37.3	....	50.5	....	74.2	92.8	124
		Torque	34.9	....	45.6	....	68.4	85.5	117
25.63	56	Mechanical Hp	31.8	....	43.3	....	60.0	75.0	103
		Torque	35.4	....	48.0	....	68.4	85.5	120
31.39	45	Mechanical Hp	....	27.6	....	40.6	....	58.8	87.3
		Torque	....	39.1	....	57.3	....	82.0	124

① AGMA ratios ± 4%.

Note: Horsepower and torque ratings shown in bold type are limited by thermal capacity if the reducer is operated continuously for more than three hours. See thermal horsepower capacity table on page 5.