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

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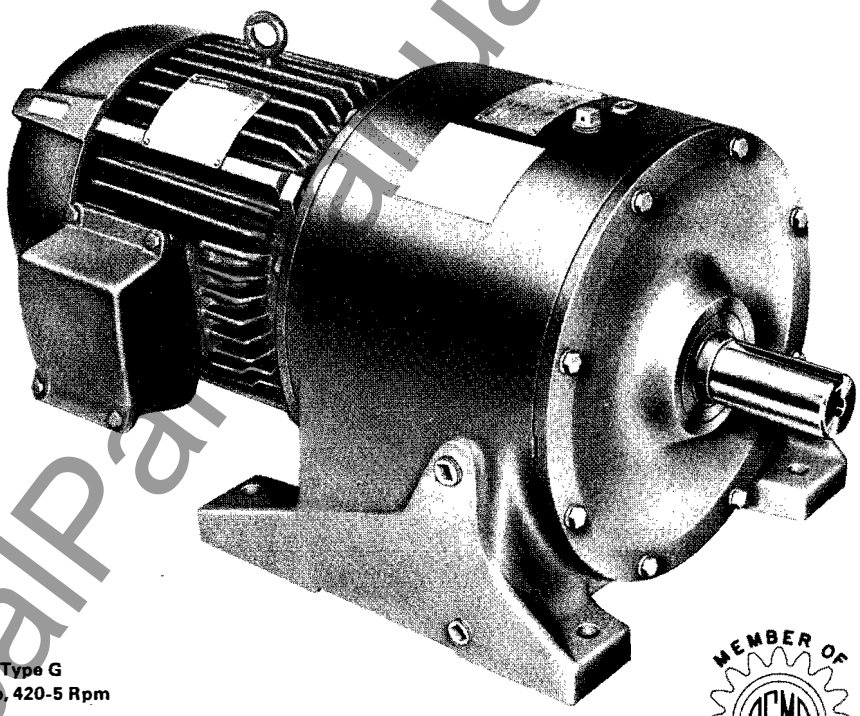
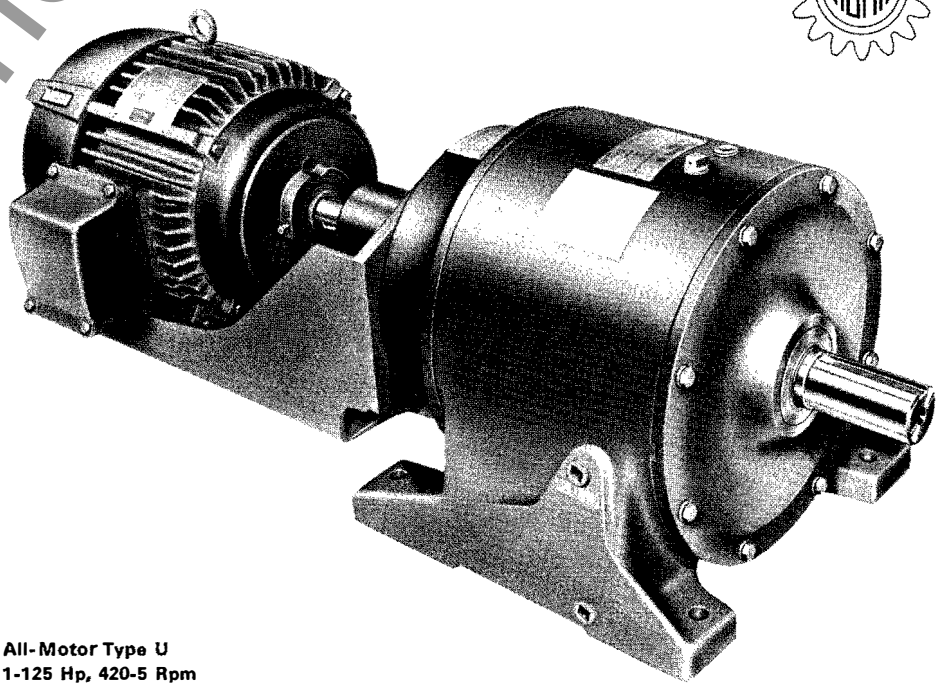
Supersedes 2971-2 A WE A
Application Data
pages 1-8 dated September, 1975.
Mailed to: E, D, C/1778/DB

Integral and All-Motor Types
Horizontal, AGMA Class I, II and III

Moduline® Gearmotors

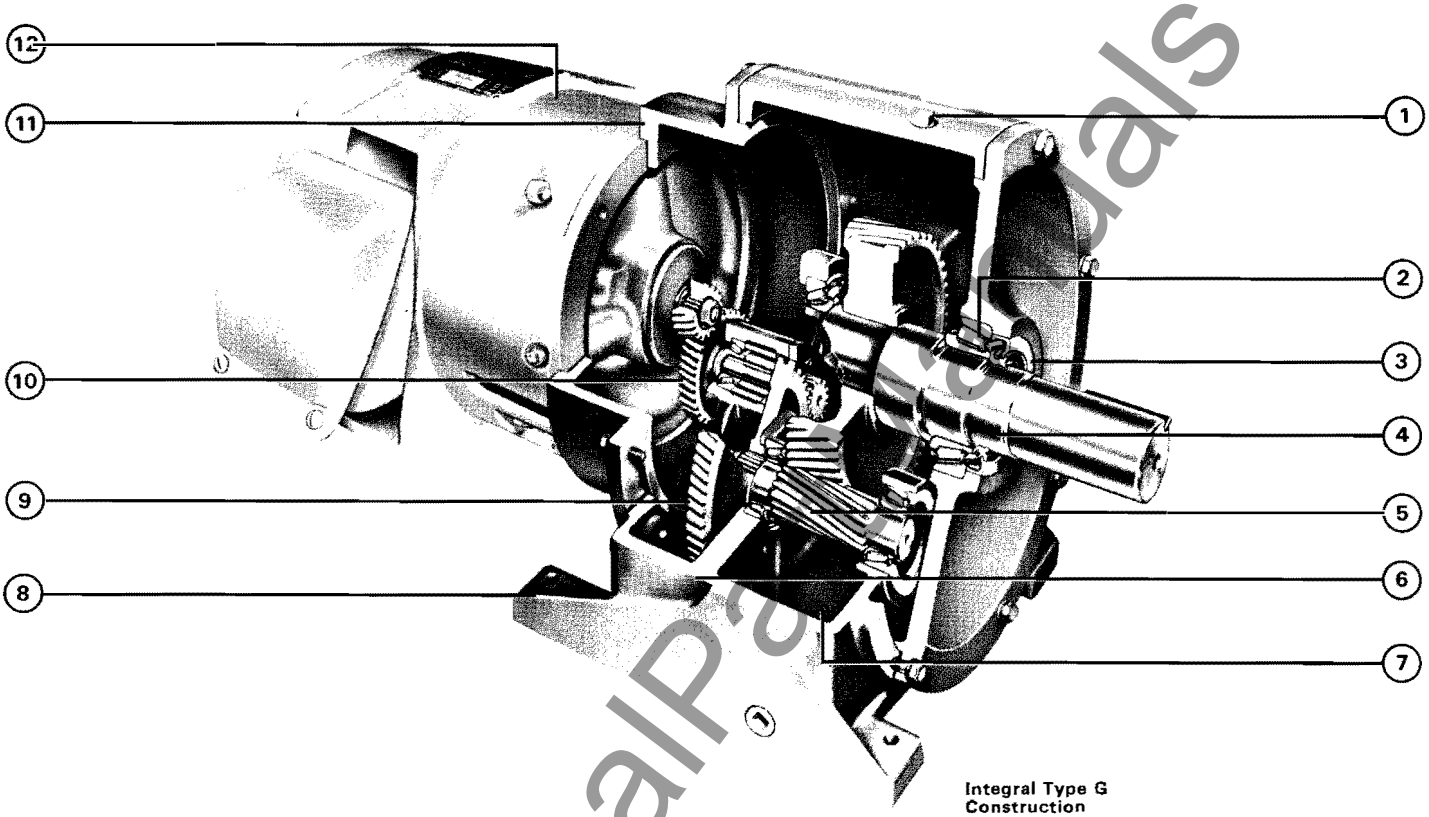


Integral Type G
1-125 Hp, 420-5 Rpm



All-Motor Type U
1-125 Hp, 420-5 Rpm

Construction



Integral Type G Construction

① A combination breather – filler plug keeps overall height at a minimum.

② Single row tapered roller bearings are used on all gear unit shafts. These bearings are conservatively selected in accordance with bearing manufacturers' recommendations to provide maximum load carrying capacity and reliability.

③ Dual lip seals are used exclusively by Westinghouse to retain oil effectively and to protect against entry of contaminants. This assures long, trouble-free life.

④ Output shaft of chrome-moly steel supported on a wide bearing span provides generous overhung load capacity.

⑤ 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.

⑥ A sturdy one-piece cast iron housing with integrally cast and precision 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.

⑦ Large oil reservoir and splash system provide positive lubrication of all gears and bearings.

⑧ Rugged feet are integrally cast to provide maximum strength. Foot pads are accurately milled to assure ease of alignment.

⑨ 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.

⑩ The high speed pinion and gear are mounted on splined shafts. The splines are cold rolled and the major diameter 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.

⑪ A standardized motor flange and rabbet fit provide accurate, built in alignment of motor and gear, on Integral Type G units, assuring longer gear life and minimum maintenance.

⑫ Standard Westinghouse motor designs are used. Westinghouse motor and gearing products are designed and manufactured in one facility, thus assuring a single source of responsibility and readily available stock.

Selection and Pricing
1. Establish the following information for the application:
Horsepower
Output Rpm
Motor Characteristics – Enclosure
Phase, Hertz, Voltage
AGMA Load Classification (refer to page 4)
Gearmotor Type (G or U)

2. Turn to pages 6 and 7 or 8 and 9 for gear selection depending on Gearmotor type (G or U). Locate the table for the desired AGMA load classification. Select the desired output rpm in the first column and the appropriate horsepower across the top column – obtain the gear frame size. Record the gearmotor type, AGMA class, output rpm, horsepower, and gear frame size for later use in writing the order.

3. Refer to Price List 2971-3 for gearmotor pricing. Integral Type G gearmotor prices **include** the motor. All-motor type U gearmotor prices do **not** include the motor. If a motor is required with an All-motor Type U gearmotor, the motor must be priced separately from the appropriate motor Price List (PL 2920, 2925, 2926, 2927, 2940 or 2960).

Note: Brake equipment motors – when the torque rating of a brake exceeds the torque rating of the motor, the rating of the brake should be the guide in selecting the proper gearmotor.

Selection and Pricing Examples
The following examples are provided as a guide to correct selection and pricing:

Example I – Type G (Integral): A customer requires an integral gearmotor for a uniformly loaded belt conveyor running at 37 rpm, 24 hours a day with steady torque requirements. The motor is to be 10 hp, ac, 3 phase, 60 hertz, 230/460 volts NEMA design B with totally enclosed fan cooled enclosure. The gearmotor will be horizontal, floor mounted, and direct coupled to the conveyor.

Solution I:
1. All information required to use the selection and pricing tables is known except for the AGMA load classification. Turn to page 4. Find conveyors, belt, uniform load, 24 hour per day service, and note that class II gearing is required.
2. Turn to pages 6 and 7 for Integral Type G Gearmotors and locate the class II table. In the first column find 37 rpm. Read across the 37 rpm column until you reach 10 hp and select gear frame size 54T.
3. No Gear end modifications are involved.
4. A coupling is not required.
5. Mounting is standard. Overhung and thrust loads are not involved since direct connection is used.
6. For pricing information:
Price List 2984-3 page 6, $2628, discount symbol GM-1.
Motor price adder for TEFC enclosure $62
Total Gearmotor price – $2690 GM-1.
7. For ordering information:
This page, column three.

Example II – Type G (Integral): Repeat example I, except the conveyor is not uniformly fed but has 20 load peaks per hour with a 5-second duration on each peak and a peak load 200% of full load. The conveyor operates 8 hours per day.

Solution II:
1. The AGMA load classification table on page 4 carries an introductory statement that the table does not cover duty cycle applications and to refer to page 5. On page 5 allowable peak load curves are provided to permit selection of the proper AGMA load class.
2. 20 peaks per hour at 200% of full load at 5 seconds each exceeds the AGMA class I table. From the AGMA class II table, 20 peaks per hour at 200% of full load is permissable with a 10-second duration on the peak load. Since the application involves only 5-second duration, class II gearing is adequate and the gearmotor previously selected is also correct for this situation.
3. Note that increasing the peak load to 250% of full load would necessitate use of class III gearing.

Example III – Type U (All-Motor): A customer requires a 20 hp AGMA class II, all-motor gearmotor, 56 rpm, 3/60/230/460, TEFC, shaft to be 5 inches longer than standard, unit to be boxed for export.

Solution III
1. Turn to pages 8 and 9 for All-motor Type U Gearmotor and locate the class II table. Read down to 56 rpm output gear speed and across to 20 hp. Select gear frame size 64T.
2. For pricing information:
Gear end – Price List 2984-3 page 2, $3398, discount symbol UM-1.
Special shaft 5" longer than standard, $272 (basic adder plus).
Export boxed – $176
Total Gear End – $3846 UM-1
Motor End from Price List 2920 – $628 W3T (20 hp, 1800 rpm, TEFC motor)
3. For ordering information:
This page, column three.

Example IV – Type U: Repeat example III except the customer now desires to include a 75 pound foot motor mounted brake, standard enclosure, and a TS Thermoguard thermal protector on the motor.

Solution IV:
1. Since there has been no changes made in the gear end, we can use that portion of the solution discussed previously under example III.
2. Since we no longer have a Standard-Line motor, we must choose our motor price from Price List 2940. Starting on page 6 of Price List 2940, under basic motors, we choose a 20 Hp, TEFC, NEMA B motor, 1800 rpm frame 256T at $832 list with a K modification symbol. Now turning to page 3 of the modification section, Price List 2990, we choose a 75 pound foot brake at $742 list.
Next, on page 8 we find the price of a TS Thermoguard to be $20 list. Adding these modifications to our basic motor price, we arrive at a total motor list price of $1594, W2T.

Ordering Information
Designation System: A simple designation system provides the basic identification of the gearmotor used in order writing.
For example: 184A21T
184 – motor frame.
A – AGMA load classification:
A – class I, B – class II, C – class III.
21T – gear frame size and reduction:
There are nine gear frame sizes – 10, 21, 32, 43, 54, 64, 76, 88 and 92.
S – single reduction
D – double reduction
T – triple reduction
Q – quadruple reduction

Ordering: The following information must be provided for each order to permit manufacture and assembly of the correct gearmotor.
1. Quantity
2. Motor characteristics:
Horsepower
Type
Enclosure
Phase
Hertz
Voltage
Modifications (describe in detail)
3. Gearmotor characteristics:
Type (integral type G or all-motor type U)
Output rpm
AGMA class (I, II or III)
Designation (e.g. 184A21T)
Mounting position
Modifications (describe in detail)
4. Pricing:
Gearmotor list price
Motor list price
Discounts
Net price
5. Shipment required.

Note: List prices in examples are subject to change without notice.

Typical Gearmotor Applications – AGMA Standard Practices

AGMA standard practice recognizes three classes of integral and all-motor gearmotors based on load conditions and service required. The table illustrates the difference between these classes. For load conditions not included in the table, refer to Westinghouse. For peak loading applications, refer to curves on page 5.

Class I: For steady loads not exceeding normal rating of motor and 10 hours a day service. Moderate shock loads where service is intermittent.
Class II: For steady loads not exceeding normal rating of motor and 24 hours a day. Moderate shock loads for 10 hours a day.
Class III: Moderate shock loads for 24 hours a day. Heavy shock loads for 10 hours a day.

Table 1: Typical Applications

Application	Hours Service per Day	
	Over 3 Up to 10	Over 10
	AGMA Classes	
Agitators		
Pure liquids	I	II
Liquids and solids	II	II
Liquids, variable density	II	II
Semi-liquids	II	III①
Blowers		
Centrifugal	I	II
Lobe	II	II
Vane	I	II
Brewing and Distilling		
Bottling machinery	I	II
Brew kettles, cont. duty	..	II
Cookers, continuous duty	..	II
Mash tube, cont. duty	..	II
Scale hopper, frequent starts	II	II
Car Dumpers	III	..
Can Filling Machines	I	II
Cane Knives	II	II
Car Pullers		
Intermittent duty	I	..
Clarifiers	I	II
Classifiers	II	II
Clay Working Machinery		
Brick press	III	III①
Briquette machine	III	III①
Clay working machinery	II	II
Pug mill	II	II
Compressors		
Centrifugal	I	II
Lobe	II	II
Reciprocating		
Multi-cylinder	II	II①
Single Cylinder	III	III①
Conveyors, Uniformly Loaded or Fed		
Apron	I	II
Assembly	I	II
Belt	I	II
Bucket	I	II
Chain	I	II
Flight	I	II
Oven	I	II
Screw	I	II
Conveyors, Heavy Duty – Not Uniformly Fed		
Apron	II	II
Assembly	II	II
Belt	II	II
Bucket	II	II
Chain	II	II
Flight	II	II
Live roll (package)	I	II
Oven	II	II
Reciprocating	III	III①
Screw	II	II
Shaker	III	III①

Application	Hours Service per Day	
	Over 3 Up to 10	Over 10
	AGMA Classes	
Cranes and Hoists		
Main hoists		
Heavy duty	III	III①
Medium duty	II	II
Reversing	II	II
Skip hoists	II	II
Trolley drive	II	II①
Bridge drive	II	II①
Crushers		
Ore	III	III
Stone	III	III
Dredges		
Cable reels	II	..
Conveyors	II	II
Cutter head drives	III	III①
Jig drives	III	III①
Maneuvering winches	II	..
Pumps	II	II
Screen drive	III	III①
Stackers	II	II
Utility winches	II	..
Elevators		
Bucket, uniform load	I	II
Bucket, heavy load	II	II
Bucket, continuous	I	II
Centrifugal discharge	I	II
Escalators	I	I
Freight	II	II
Gravity discharge	I	II
Man lifts	②	②
Passenger	②	②
Service, hand lift	III	..
Fans		
Centrifugal	II	II
Cooling towers		
Induced draft	II	II
Forced draft	②	②
Induced draft	II	II
Large (mine, etc)	II	II①
Large industrial	II	II①
Light (small diameter)	I	II
Feeders		
Apron	II	II
Belt	II	II
Disk	I	II
Reciprocating	III	III①
Screw	II	II
Food industry		
Beet slicer	II	II
Cereal cooker	I	II
Dough mixer	II	II
Meat grinders	II	II
Generators (not Welding)	I	II
Hammer Mills	III	III①
Laundry Tumblers	II	II
Laundry Washers		
Reversing	II	II
Line Shafts		
Heavy shock load	III	III①
Moderate shock load	II	II
Uniform shock load	I	II

Application	Hours Service per Day	
	Over 3 Up to 10	Over 10
	AGMA Classes	
Lumber		
Barkers – Spindle Feed	II	III
Barkers – Main Drive	III	III①
Carriage Drive	②	②
Conveyors – Burner	II	III
Conveyors – Main or Heavy Duty	II	III
Conveyors – Main Log	III	III①
Conveyors – Merry-Go-Round	II	III
Conveyors – Slab	III	III①
Conveyors – Transfer	II	III
Conveyors – Waste	II	II
Chains – Floor	II	III
Chains – Green	II	III
Cut-Off Saws – Chain	II	III
Cut-Off Saws – Drag	II	III
Debarking Drums	III	III①
Feeds – Edger	II	III
Feeds – Gang	III	III①
Feeds – Trimmer	II	III
Log Deck	III	III①
Log Hauls – Incline – Well Type	III	III①
Log Turning Devices	III	III①
Planer Feed	II	III
Planer Tilting Hoists	II	III
Rolls – Live- Off Brg. – Roll Cases	III	III①
Sorting Table	II	III
Tipple Hoist	II	III
Transfers – Chain	II	III
Transfers – Crane way	II	III
Tray Drives	II	III
Veneer Lathe Drives	②	②
Machine Tools		
Bending roll	II	II
Notching press, belt driven	②	②
Plate planer	III	III①
Punch press, gear driven	III	III①
Tapping machines	III	III①
Other machine tools		
Main drives	II	II
Auxiliary drives	I	II
Metal Mills		
Bridle Roll Drives	III	III①
Draw bench, carriage	III	III①
Draw bench, main drive	III	III①
Forming machines	III	III①
Pinch dryer and scrubber rolls, reversing	②	②
Slitters	II	II
Table conveyors		
Non-reversing	II	III
Reversing	..	III
Winding reels – strip	..	III
Wire drawing and flattening machine	II	III
Wire winding machine	II	II
Mills, Rotary Type		
Ball	III	III①
Cement kilns	②	②
Dryers and coolers	II	II
Kilns	II	II
Pebble	III	III①
Rod	III	III①
Tumbling barrels	III	III①

① Classes listed are minimum, and normal conditions are assumed. In view of varying load conditions, it is suggested that these applications be carefully reviewed before final selection is made.

② Check safety codes and refer to Westinghouse.

Table 1: Typical Applications Continued

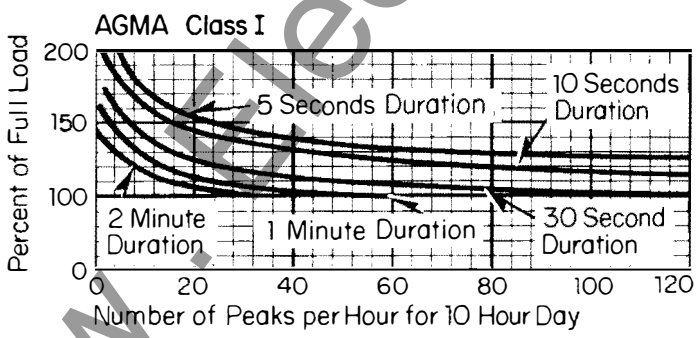
Application	Hours Service per Day: Over 3 Up to 10 (AGMA Classes)	Hours Service per Day: Over 10 (AGMA Classes)
Mixers		
Concrete mixers, continuous	II	II
Concrete mixers, intermittent	I	..
Constant density	I	II
Variable density	II	II
Oil Industry		
Chillers	II	II
Oil well pumping	②	②
Paraffin filter press	II	II
Rotary kilns	II	II
Paper Mills		
Aerators	②	②
Agitators (mixers)	II	II
Barker auxiliaries, hydraulic	..	III
Barker, mechanical	..	III
Barking drum	..	III①
Beater and pulper	..	II①
Bleacher	..	II
Calenders	..	II①
Calenders, super	..	II
Converting machines, except cutters, platers	..	II
Conveyors	..	II
Couch	..	II①
Cutters, platers	..	III①
Cylinders	..	II
Dryers	..	II①
Felt stretcher	..	II
Felt whipper	..	III①
Jordans	..	III
Log haul	..	III①
Presses	..	II①
Pulp machines	..	II
Reel	..	II
Stock chests	..	II
Suction roll	..	II①
Washers and thickeners	..	II①
Winders	..	II
Printing Presses	I	II
Pullers		
Barge haul	III	III①
Pumps		
Centrifugal	I	II
Proportioning	II	II①
Reciprocating		
Single acting, 3 or more cylinders	II	II
Double acting, 2 or more cylinders	II	II
Single acting, 1 or 2 cylinders	②	②
Double acting, single cylinder	②	②
Rotary – gear type	I	II
Lobe, vane	I	II
Rubber Industry		
Mixer	III	III①
Rubber calender	II	II①
Rubber mill (2 or more)	II	II①
Sheeter	II	II①
Tire building machines	②	②
Tire and tube press openers	②	②
Tubers and strainers	II	II
Screens		
Air washing	I	II
Rotary – stone or gravel	II	II
Traveling water intake	I	II
Sewage Disposal Equip.		
Aerators	②	②
Bar screens	I	II
Chemical feeders	I	II
Collectors, circuline or straightline	I	II
Dewatering screws	II	II
Grit collectors	I	II
Scum breakers	II	II
Sewage Disposal Equip. (Cont.)		
Slow or rapid mixers	II	II
Sludge collectors	I	II
Thickeners	II	II
Vacuum filters	II	II
Slab Pushers	II	II
Steering Gear	II	II
Stokers	I	II
Textile Industry		
Batchers	II	II
Calenders	II	II
Card machines	II	II①
Cloth finishing machines (washers, pads, tenters, dryers, calenders, etc)	II	II
Dry cans	II	II
Dyeing machinery	II	II
Knitting machines (Looms, etc)	II	II
Looms	II	II
Mangles	II	II
Nappers	II	II
Range drives	②	②
Slashers	II	II
Soapers	II	II
Spinners	II	II
Tenter frames	II	II
Washers	II	II
Winders (other than batchers)	II	II
Yarn preparatory machines (cards, spinners, slashers, etc)	II	II
Windlass	II	II①

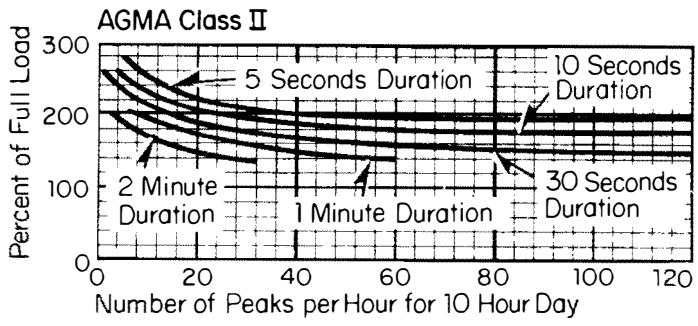
① Classes listed are minimum, and normal conditions are assumed. In view of varying load conditions, it is suggested that these applications be carefully reviewed before final selection is made.

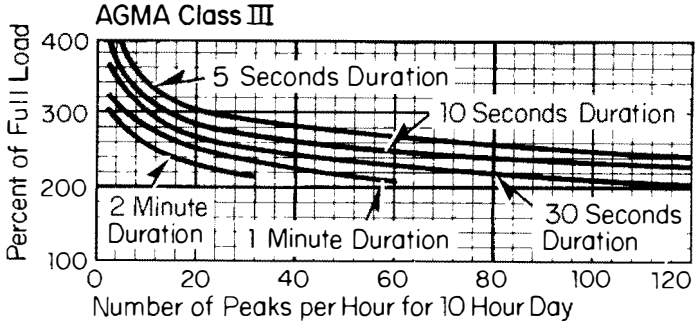
② Check safety codes and refer to Westinghouse.

Allowable Peak Loadings

For duty cycle applications, consult the following curves to determine the correct AGMA class.







Integral Type G Moduline Gearmotors

Output Rpm	Horsepower																
	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125
	Frame																
	143T ②	145T ②	145T ②	182T	184T	213T	215T	254T	256T	284T	286T	324T	326TS	364TS	365TS	404TS ③	405TS ④
Class I – Unit Size																	
780Ⓒ	10S	10S	10S	10S	10S	32S	32S	32S	43S	43S	43S	54S	76S	76S	76S	...	...
640Ⓒ	10S	10S	10S	10S	10S	32S	32S	43S	43S	43S	54S	76S	76S	76S	76S	...	...
520Ⓒ	10S	10S	10S	21S	21S	32S	32S	43S	43S	54S	54S	76S	76S	76S	...	...	...
420	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	43D	54D	54D	76D	76D	88D	88D
350	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	43D	54D	54D	76D	76D	88D	88D
280	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	43D	54D	54D	64D	76D	76D	88D
230	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	43D	54D	54D	64D	76D	76D	88D
190	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	43D	54D	54D	64D	76D	76D	88D
155	10D	10D	10D	10D	10D	21D	21D	32D	32D	43D	43D	54D	54D	64D	76D	76D	88D
125	10D	10D	10D	10D	10D	21D	21D	32D	43D	43D	54D	54D	64D	64D	76D	76D	88D
100	10D	10D	10D	10D	10D	21D	32D	43D	43D	54D	54D	64D	64D	76D	76D	88D	88D
84	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	64D	76D	76D	88D	88D	92D
68	10D	10D	10D	21D	21D	32D	43D	54D	54D	64D	64D	76D	76D	88D	88D	92D	92D
56	10D	10D	10D	21D	32D	43D	43T	54D	54T	64T	64T	76T	88D	88D	92D	92D	...
45	21D	21D	21D	21T	32D	43D	43T	54T	64T	64T	76T	76T	88D	88D	92D	...	...
37	21T	21T	21T	21T	32T	43T	54T	54T	64T	76T	76T	88T	88T	92T	92T	...	...
30	21T	21T	21T	21T	43T	54T	54T	64T	76T	76T	88T	88T	92T	...	...	...	...
25	21T	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	88T	92T	...	...	...	...
20	21T	21T	21T	32T	43T	54T	64T	76T	88T	88T	88T	92T	...	...	...	...	...
16.5	21T	21T	32T	43T	54T	64T	64T	76T	88T	88T	92T	...	...	...	...	...	...
13.5	21T	21T	32T	43T	54T	64T	76T	88T	88T	92T	92T	...	...	...	...	...	...
11.0	32T	32T⑤	43T	54T	54T	76T	76T	88T	92T	92T	...	...	...	...	...	...	...
9.0	32T	32T⑤	43T	54T⑤	64T⑤	76QⒸ	88T	88QⒸ	92T	...	...	...	...	...	...	...	...
7.5	32QⒸ	43T⑤	43QⒸ	54QⒸ	64T⑤	76QⒸ	88QⒸ	...	...	...	...	...	...	...	...	...	...
6.0	32QⒸ	43QⒸ	54T⑤	64QⒸ	76QⒸ	88QⒸ	88QⒸ	...	...	...	...	...	...	...	...	...	...
5.0	43QⒸ	54T⑤	54QⒸ	64QⒸ	76QⒸ	88Q	...	...	...	...	...	...	...	...	...	...	...
4.0Ⓒ	43Q	54Q	64Q	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...
3.2Ⓒ	54Q	54Q	64Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...
2.7Ⓒ	54Q	64Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...
2.2Ⓒ	76Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
1.8Ⓒ	88Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.5Ⓒ	88Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Class II – Unit Size																	
780Ⓒ	10S	10S	10S	10S	10S	32S	32S	43S	43S	54S	54S	76S	76S	76S	...	...	...
640Ⓒ	10S	10S	10S	10S	21S	32S	43S	43S	54S	54S	76S	76S	76S	...	...	...	...
520Ⓒ	10S	10S	10S	21S	21S	32S	43S	54S	54S	76S	76S	76S	...	...	...	...	...
420	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	54D	54D	54D	76D	76D	88D	88D
350	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	54D	54D	54D	76D	76D	88D	88D
280	10D	10D	10D	10D	10D	21D	21D	32D	32D	32D	54D	54D	54D	64D	76D	76D	88D
230	10D	10D	10D	10D	10D	21D	21D	32D	32D	43D	54D	54D	54D	64D	76D	76D	88D
190	10D	10D	10D	10D	10D	21D	21D	32D	43D	43D	54D	54D	64D	64D	76D	76D	88D
155	10D	10D	10D	10D	10D	21D	21D	32D	43D	54D	54D	64D	64D	76D	76D	88D	88D
125	10D	10D	10D	10D	21D	21D	32D	43D	54D	54D	54D	64D	76D	76D	88D	88D	92D
100	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	64D	76D	76D	76D	88D	92D	92D
84	10D	10D	10D	21D	21D	32D	43D	54D	54D	64D	64D	76D	88D	88D	88D	92D	...
68	10D	10D	21D	21D	32D	43D	43D	54D	64D	64D	76D	88D	88D	88D	92D	...	...
56	10D	10D	21D	21T	32T	43T	54D	54T	64T	76T	76T	88D	88D	92D	92D	...	...
45	21D	21D	21D	21T	32T	43T	54T	64T	76T	76T	88D	88D	88T	92D	...	...	...
37	21T	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	88T	92T	...	...	...	...
30	21T	21T	21T	32T	43T	54T	64T	76T	76T	88T	88T	92T	...	...	...	...	...
25	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...
20	21T	21T	32T	43T	54T	64T	76T	88T	88T	92T	92T	...	...	...	...	...	...
16.5	21T	32T	32T	43T	54T	64T	76T	88T	92T	92T	...	...	...	...	...	...	...
13.5	21T	32T	43T	54T	64T	76T	76T	92T	92T	...	...	...	...	...	...	...	...
11.0	32T	43T	43T⑤	54T⑤	64T	76T	88T	92T	...	...	...	...	...	...	...	...	...
9.0	32QⒸ	43QⒸ	54T	64T⑤	76T⑤	88T	88T	...	...	...	...	...	...	...	...	...	...
7.5	43QⒸ	54T	54T⑤	64T⑤	76T⑤	88QⒸ	88QⒸ	...	...	...	...	...	...	...	...	...	...
6.0	43QⒸ	54T⑤	64QⒸ	76QⒸ	88T⑤	88QⒸ	...	...	...	...	...	...	...	...	...	...	...
5.0	43QⒸ	54QⒸ	64QⒸ	76QⒸ	88QⒸ	...	...	...	...	...	...	...	...	...	...	...	...
4.0Ⓒ	54Q	64Q	76Q⑥	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...
3.2Ⓒ	54Q	64Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
2.7Ⓒ	64Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
2.2Ⓒ	76Q	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
1.8Ⓒ	88Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.5Ⓒ	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

② Open drip-proof motors are frame 182T.
③ TEFC motor Frame 405TS.
④ TEFC motor not available.
⑤ These units require 1200 Rpm motors. Refer to Price List 2920 or 2940 for frame size.
⑥ Motor Frame 182T, both drip-proof and TEFC.
Ⓒ Changed or added since previous issue.

Integral Type G Moduline Gearmotors Continued

Output Rpm	Horsepower																
	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125
	Frame																
	143T ②	145T ②	145T ②	182T	184T	213T	215T	254T	256T	284T	286T	324T	326TS	364TS	365TS	404TS ③	405TS ④
Class III – Unit Size																	
780Ⓒ	10S	10S	10S	10S	21S	32S	43S	43S	54S	76S	76S	76S	...	...	...	...	...
640Ⓒ	10S	10S	10S	10S	32S	43S	43S	54S	76S	76S	76S	...	...	...	...	...	...
520Ⓒ	10S	10S	10S	21S	32S	43S	43S	54S	76S	76S	76S	...	...	...	...	...	...
420	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	76D	76D	76D	88D	88D
350	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	64D	76D	76D	88D	88D
280	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	64D	64D	76D	76D	88D
230	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	64D	64D	76D	76D	88D	88D
190	10D	10D	10D	10D	10D	21D	32D	43D	43D	54D	54D	64D	76D	76D	76D	88D	88D
155	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	64D	76D	76D	76D	88D	88D	92D
125	10D	10D	10D	10D	21D	32D	43D	54D	54D	64D	64D	76D	76D	88D	88D	92D	...
100	10D	10D	10D	21D	32D	43D	43D	54D	64D	64D	76D	76D	88D	88D	92D	...	...
84	10D	10D	10D	21D	32D	43D	54D	54D	64D	76D	76D	88D	88D	92D	92D	...	...
68	10D	21D	21D	32D	43D	54D	54D	64D	76D	76D	88D	88D	92D	92D	...	...	...
56	10D	21D	21T	32D	43T	54D	54T	64T	76T	88D	88D	88T	92D	...	...	...	...
45	21D	21D	21T	32T	43T	54T	64T	76T	76T	88D	88D	92D	...	...	...	...	...
37	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...
30	21T	21T	32T	43T	54T	64T	76T	88T	88T	92T	92T	...	...	...	...	...	...
25	21T	32T	43T	43T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...	...
20	21T	32T	43T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...	...	...
16.5	32T	43T	43T	54T	64T	76T	88T	92T	...	...	...	...	...	...	...	...	...
13.5	32T	43T	54T	54T	76T	88T	88T	92T	...	...	...	...	...	...	...	...	...
11.0	43T	43T⑤	54T	64T	76T	88T	92T	...	...	...	...	...	...	...	...	...	...
9.0	43QⒸ	54T	54T⑤	64T⑤	88T	88T⑤	92T	...	...	...	...	...	...	...	...	...	...
7.5	43QⒸ	54T⑤	64T⑤	76T⑤	88T	92T	...	...	...	...	...	...	...	...	...	...	...
6.0	54T⑤	64QⒸ	76Q⑥Ⓒ	76QⒸ	88QⒸ	...	...	...	...	...	...	...	...	...	...	...	...
5.0	54QⒸ	64QⒸ	76Q⑥Ⓒ	88QⒸ	92T⑤Ⓒ	...	...	...	...	...	...	...	...	...	...	...	...
4.0Ⓒ	64Q	76Q⑥	76Q⑥	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
3.2Ⓒ	64Q	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
2.7Ⓒ	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.2Ⓒ	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.8Ⓒ	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.5Ⓒ	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

② Open drip-proof motors are frame 182T.
③ TEFC motor Frame 405TS.
④ TEFC motor not available.
⑤ These units require 1200 Rpm motors. Refer to Price List 2920 or 2940 for frame size.
⑥ Motor Frame 182T, both drip-proof and TEFC.
Ⓒ Changed or added since previous issue.

All-Motor Type U Moduline Gearmotors

Output Rpm	Horsepower																	
	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150
	Frame																	
	143T	145T	145T	182T	184T	213T	215T	254T	256T	284T	286T	324T	326TS	364TS	365TS	404TS ③	405TS ⑦	444TS ⑧⑨
Class I – Unit Size																		
420	10D	10D	10D	10D	10D	10D	10D	32D	32D	32D	43D	54D	54D	76D	76D	88D	88D	...
350	10D	10D	10D	10D	10D	10D	10D	32D	32D	32D	43D	54D	54D	64D	76D	88D	88D	...
280	10D	10D	10D	10D	10D	10D	10D	32D	32D	32D	43D	54D	54D	64D	76D	76D	88D	92D
230	10D	10D	10D	10D	10D	10D	10D	32D	32D	32D	43D	54D	54D	64D	76D	76D	88D	92D
190	10D	10D	10D	10D	10D	10D	10D	32D	32D	32D	43D	54D	54D	64D	76D	76D	88D	92D
155	10D	10D	10D	10D	10D	10D	21D	32D	32D	43D	43D	54D	54D	64D	76D	76D	88D	92D
125	10D	10D	10D	10D	10D	21D	21D	32D	43D	43D	54D	54D	64D	64D	76D	76D	88D	92D
100	10D	10D	10D	10D	10D	21D	32D	43D	43D	54D	54D	64D	64D	76D	76D	88D	88D	92D
84	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	64D	76D	76D	88D	88D	92D	92D
68	10D	10D	10D	21D	21D	32D	43D	43D	54D	54D	64D	76D	76D	88D	88D	92D	92D	...
56	10D	10D	10D	21D	32D	43D	43T	54D	54T	64T	64T	76T	88D	88D	92D	92D	...	...
45	21D	21D	21D	21D	32D	43D	43T	54T	64T	64T	76T	76T	88D	88D	92D	...	...	...
37	21T	21T	21T	21T	32T	43T	54T	54T	64T	76T	76T	88T	88T	92T	92T	...	...	...
30	21T	21T	21T	21T	43T	54T	54T	64T	76T	76T	88T	88T	92T	92T	...	...	...	...
25	21T	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	88T	92T	...	...	...	...	...
20	21T	21T	21T	32T	43T	54T	64T	76T	88T	88T	88T	92T	...	...	...	...	...	...
16.5	21T	21T	32T	43T	54T	64T	64T	76T	88T	88T	92T	...	...	...	...	...	...	...
13.5	21T	21T	32T	43T	54T	64T	76T	88T	88T	92T	92T	...	...	...	...	...	...	...
11.0	32T	32T⑤	43T	54T	54T	76T	76T	88T	92T	92T	...	...	...	...	...	...	...	...
9.0	32T	32T⑤	43T	54T	64T⑤	76T⑤	88T	88T⑤	92T	...	...	...	...	...	...	...	...	...
7.5	32Q●	43T⑤	43Q●	54Q●	64T⑤	76T⑤	88T	92T	...	...	...	...	...	...	...	...	...	...
6.0	32Q●	43Q●	54T⑤●	64Q●	76Q●	88T⑤●	88Q●	...	...	...	...	...	...	...	...	...	...	...
5.0	43Q●	54T⑤●	54Q●	64Q●	76Q●	88T⑤●	92T⑤●	...	...	...	...	...	...	...	...	...	...	...
4.0●	43Q	54Q	64Q	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...
3.2●	54Q	54Q	64Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
2.7●	54Q	64Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
2.2●	76Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.8●	88Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.5●	88Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Class II – Unit Size																		
420	10D	10D	10D	10D	10D	10D	21D	32D	32D	32D	54D	54D	54D	76D	76D	88D	88D	...
350	10D	10D	10D	10D	10D	10D	21D	32D	32D	32D	54D	54D	54D	64D	76D	88D	88D	...
280	10D	10D	10D	10D	10D	10D	21D	32D	32D	32D	54D	54D	54D	64D	76D	76D	88D	92D
230	10D	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	64D	76D	76D	88D	92D
190	10D	10D	10D	10D	10D	21D	21D	32D	43D	43D	54D	54D	64D	64D	76D	76D	88D	92D
155	10D	10D	10D	10D	10D	21D	21D	32D	43D	54D	54D	64D	64D	76D	76D	88D	88D	92D
125	10D	10D	10D	10D	21D	21D	32D	43D	54D	54D	54D	64D	76D	76D	88D	88D	92D	92D
100	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	64D	76D	76D	76D	88D	92D	92D	...
84	10D	10D	10D	21D	21D	32D	43D	54D	54D	64D	64D	76D	88D	88D	88D	92D	...	...
68	10D	10D	21D	21D	32D	43D	43D	54D	64D	64D	76D	88D	88D	88D	92D	...	...	...
56	10D	10D	21D	21T	32T	43T	54D	54T	64T	76T	76T	88D	88D	92D	92D	...	...	...
45	21D	21D	21D	21T	32T	43T	54T	64T	76T	76T	88D	88D	88T	92D	...	...	...	...
37	21T	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	88T	92T	...	...	...	...	...
30	21T	21T	21T	32T	43T	54T	64T	76T	76T	88T	88T	92T	...	...	...	...	...	...
25	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...	...
20	21T	21T	32T	43T	54T	64T	76T	88T	88T	92T	92T	...	...	...	...	...	...	...
16.5	21T	32T	32T	43T	54T	64T	76T	88T	92T	92T	...	...	...	...	...	...	...	...
13.5	21T	32T	43T	54T	64T	76T	76T	92T	92T	...	...	...	...	...	...	...	...	...
11.0	32T	43T	43T⑤	54T	64T	76T	88T	92T	...	...	...	...	...	...	...	...	...	...
9.0	32Q●	43Q●	54T	64T⑤	76T⑤	88T	88T	...	...	...	...	...	...	...	...	...	...	...
7.5	43Q●	54T	54T⑤	64Q●	76T⑤	88T	88Q●	...	...	...	...	...	...	...	...	...	...	...
6.0	43Q●	54T⑤●	64Q●	76Q●	88T⑤●	88Q●	...	...	...	...	...	...	...	...	...	...	...	...
5.0	43Q●	54Q●	64Q●	76Q●	88T⑤●	92T⑤●	...	...	...	...	...	...	...	...	...	...	...	...
4.0●	54Q	64Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...
3.2●	54Q	64Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.7●	64Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.2●	76Q	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.8●	88Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.5●	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

③ TEFC motor Frame 405TS.
⑤ These units require 1200 rpm motors. Refer to Price List 2920 or 2940 for Frame Size.
⑦ TEFC motor Frame 444TS is supplied as reducer and bedplate.
⑧ TEFC motor Frame 445TS.
⑨ Unit supplied as reducer and bedplate.
● Changed or added since previous issue.

All-Motor Type U Moduline Gearmotors Continued

Output Rpm	Horsepower																	
	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150
	Frame																	
	143T	145T	145T	182T	184T	213T	215T	254T	256T	284T	286T	324T	326TS	364TS	365TS	404TS ③	405TS ⑦	444TS ⑧⑨
Class III – Unit Size																		
420	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	76D	76D	76D	88D	88D	...
350	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	64D	64D	76D	88D	88D	...
280	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	54D	64D	64D	76D	76D	88D	92D
230	10D	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	64D	64D	76D	76D	88D	88D	92D
190	10D	10D	10D	10D	10D	21D	32D	43D	43D	54D	54D	64D	76D	76D	76D	88D	88D	92D
155	10D	10D	10D	10D	21D	32D	32D	43D	54D	54D	64D	76D	76D	76D	88D	88D	92D	...
125	10D	10D	10D	10D	21D	32D	43D	54D	54D	64D	64D	76D	76D	88D	88D	92D	...	...
100	10D	10D	10D	21D	32D	43D	43D	54D	64D	64D	76D	76D	88D	88D	92D	...	...	...
84	10D	10D	10D	21D	32D	43D	54D	54D	64D	76D	76D	88D	88D	92D	92D	...	...	...
68	10D	21D	21D	32D	43D	54D	54D	64D	76D	76D	88D	88D	92D	92D	...	...	...	...
56	10D	21D	21T	32D	43T	54D	54T	64T	76T	88D	88D	88T	92D	...	...	...	...	...
45	21D	21D	21T	32T	43T	54T	64T	76T	76T	88D	88D	92D	...	...	...	...	...	...
37	21T	21T	32T	43T	54T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...	...
30	21T	21T	32T	43T	54T	64T	76T	88T	88T	92T	92T	...	...	...	...	...	...	...
25	21T	32T	43T	43T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...	...	...
20	21T	32T	43T	54T	64T	76T	88T	88T	92T	...	...	...	...	...	...	...	...	...
16.5	32T	43T	43T	54T	64T	76T	88T	92T	...	...	...	...	...	...	...	...	...	...
13.5	32T	43T	54T	54T	76T	88T	88T	92T	...	...	...	...	...	...	...	...	...	...
11.0	43T	43T⑤	54T	64T	76T	88T	92T	...	...	...	...	...	...	...	...	...	...	...
9.0	43Q●	54T	54T⑤	64T⑤	88T	88T⑤	92T	...	...	...	...	...	...	...	...	...	...	...
7.5	43Q●	54T⑤	64T⑤	76T⑤	88T	92T	...	...	...	...	...	...	...	...	...	...	...	...
6.0	54T⑤●	64Q●	76Q●	76Q●	88Q●	...	...	...	...	...	...	...	...	...	...	...	...	...
5.0	54Q●	64Q●	76Q●	88T⑤●	92T⑤●	...	...	...	...	...	...	...	...	...	...	...	...	...
4.0●	64Q	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
3.2●	64Q	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.7●	76Q	76Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2.2●	76Q	88Q	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.8●	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1.5●	88Q	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

③ TEFC motor Frame 405TS.
⑤ These units require 1200 rpm motors. Refer to Price List 2920 or 2940 for Frame Size.
⑦ TEFC motor Frame 444TS is supplied as reducer and bedplate.
⑧ TEFC motor Frame 445TS.
⑨ Unit supplied as reducer and bedplate.
● Changed or added since previous issue.

Overhung Load Capacities

Moduline Gearmotors provide generous overhung load capacity which is seldom exceeded; however, when a pulley, sprocket or pinion is to be mounted on the output shaft, the overhung load capacity of the Gearmotor 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 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 Lc and Lf factors from the tables below.

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

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

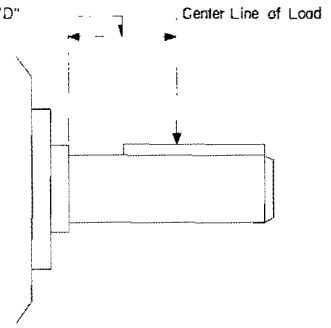
Type of Load Connection	Factor, L_c
Sprocket	1.00
Pinion	1.25
V-Belt	1.50
Fist Belt	2.50

Load Location Factor, L_f

Shaft Dia. Inches	"D" – Distance From Center Line of Load to Gearmotor 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	
	Single	Double, Triple and Quadruple
10	1.125	1.375
21	1.500	1.625
32	2.125	1.875
43	2.125	2.125
54	2.375	2.625
64	.....	3.125
76	2.375	3.625
88	.....	4.500
92	.....	5.000



Example

A belt conveyor is to be driven by a 5 hp size 21D Moduline Gearmotor, 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 at right. 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
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	10000	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.

Printed in U.S.A.

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

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Price List
2984-3

Page 1

February 28, 1978
Supersedes 2971-3 PWE A
Price List
pages 1-4 dated May 12, 1975.
Prices effective February 28, 1978 and subject to change without notice.
(Refer to Selling Policy 2900)
Mailed to: E, D, C/1778/PL

All-Motor Type U
Horizontal, AGMA Class I, II and III

Moduline® All-Motor Type U Gearmotors

Pricing Instructions
For All-Motor Gearmotors

1. Price apparent gear per AGMA Class for required horsepower and output rpm. For selection of gear size refer to Application Data 2984-2.

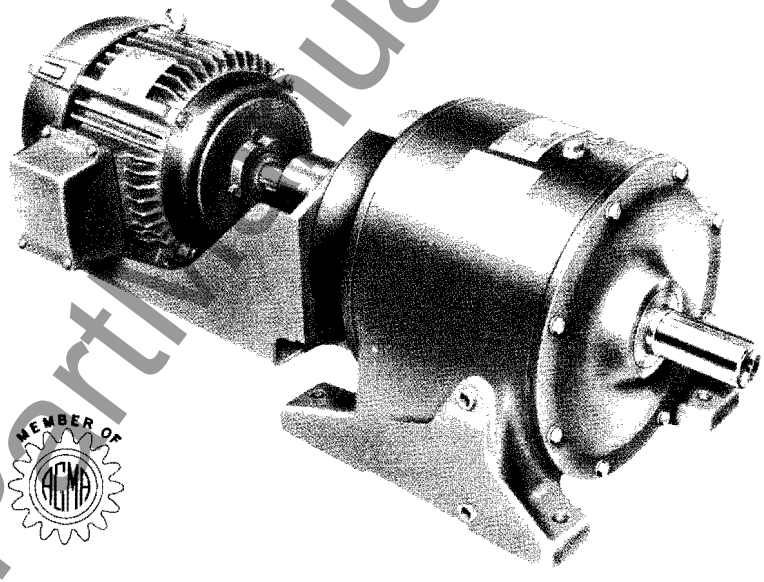
2. Use appropriate multiplier to obtain gear end net price. Refer to Selling Policy 2900.

3. Price 1800 rpm Standard-Line ac motor from Price List 2920. Use appropriate motor multiplier from Selling Policy 2900 to obtain motor net price.

4. If a Specific Purpose Ac motor is required, list price is obtained from Price List 2940. Modifications are found in Price List 2990. Refer to Selling Policy 2900 for modified motor multiplier.

5. To price any other type motor, refer to appropriate price list and discount schedule. For example: Wound Rotor motor (PL 2960, SP 2900); Dc motor (Refer to Westinghouse), etc.

6. Add Gear and Motor Net Prices to obtain gearmotor net price.



Note: Listed apparent gear end prices are for Type U All-Motor configurations. Price includes coupling and motor support.

Output Rpm	Apparent Gear End List Price, Discount Symbol UM-1																	
	Horsepower																	
	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150
AGMA Class I																		
420	$ 500	$ 542	$ 605	$ 665	$ 800	$ 922	$1023	$1138	$1317	$1517	$1695	$1958	$2254	$2549	$ 2953	$3189	$3636	....
350	502	558	610	673	808	934	1059	1241	1429	1650	1864	2072	2288	2591	2979	3368	3799	....
280	505	577	640	723	848	960	1112	1283	1475	1716	1969	2159	2375	2720	3109	3540	4128	$5095
230	511	594	666	772	901	1029	1178	1386	1587	1811	2072	2331	2556	2893	3316	3851	4456	5319
190	515	610	696	818	960	1089	1260	1471	1699	1913	2193	2487	2763	3074	3540	4188	4800	5526
155	521	627	726	874	1026	1171	1349	1590	1831	2041	2331	2677	2979	3281	3799	4577	5354	6217
125	561	673	782	937	1095	1250	1459	1716	1996	2168	2504	2893	3281	3713	4283	5181	6010	7081
100	604	726	841	1006	1178	1407	1642	1863	2161	2321	2679	3152	3627	4188	4836	5872	6735	8117
84	637	765	891	1062	1283	1518	1798	2029	2310	2602	3005	3540	4076	4706	5526	6701	7737	9274
68	683	828	954	1148	1415	1683	2006	2260	2623	2985	3419	4058	4663	5440	6390	7806	9153	....
56	726	874	1010	1221	1557	1848	2215	2540	2953	3350	3886	4577	5336	6217	7426	9015	....	....
45	798	957	1118	1346	1732	2062	2474	2903	3398	3851	4456	5267	6148	7202	8687	....	....	....
37	868	1036	1221	1478	1914	2277	2738	3299	3877	4361	5051	6010	6994	8203	10051	....	....	....
30	947	1135	1330	1633	2095	2534	3068	3745	4405	4974	5785	6908	8065	9499	....	....	....	....
25	1019	1231	1445	1782	2293	2771	3365	4207	4932	5595	6511	7772	9120	....	....	....	....	....
20	1125	1349	1597	1980	2540	3101	3794	4850	5691	6459	7512	8988	....	....	....	....	....	....
16.5	1224	1465	1765	2161	2821	3497	4289	5460	6434	7288	8546	....	....	....	....	....	....	....
13.5	1333	1617	1914	2392	3151	3959	4850	6186	7244	8337	9844	....	....	....	....	....	....	....
11.0	1452	1782	2128	2639	3497	4520	5510	7011	8287	9671	....	....	....	....	....	....	....	....
9.0	1623	1980	2359	2903	4042	5212	6383	8078	9512	....	....	....	....	....	....	....	....	....
7.5	1782	2194	2606	3250	4619	5995	7298	9252	....	....	....	....	....	....	....	....	....	....
6.0	2013	2474	2920	3695	5411	7035	8547	....	....	....	....	....	....	....	....	....	....	....
5.0	2227	2738	3200	4091	6170	8027	9772	....	....	....	....	....	....	....	....	....	....	....
4.0	2623	3233	3778	4850	7192	9434	....	....	....	....	....	....	....	....	....	....	....	....
3.2	3068	3794	4421	5675	8391	....	....	....	....	....	....	....	....	....	....	....	....	....
2.7	3497	4306	5031	6269	9641	....	....	....	....	....	....	....	....	....	....	....	....	....
2.2	4223	4982	5856	7456	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1.8	4701	5774	6747	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1.5	5400	6600	7700	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Output Rpm	Apparent Gear End List Price, Discount Symbol UM-1																	
	Horsepower																	
	1	1.5	2	3	5	7.5	10	15	20	25	30	40	50	60	75	100	125	150
AGMA Class II																		
420	$ 575	$ 635	$ 696	$ 762	$ 920	$1060	$1175	$1308	$1516	$1740	$1943	$2254	$2611	$2938	$3218	$3664	$4182	....
350	577	642	702	775	930	1074	1218	1427	1643	1898	2144	2383	2631	2980	3426	3873	4369	....
280	581	664	737	832	975	1104	1279	1476	1696	1973	2264	2483	2731	3128	3575	4071	4747	$5859
230	589	683	767	888	1036	1184	1355	1594	1825	2083	2383	2681	2939	3327	3813	4429	5124	6117
190	592	702	801	942	1104	1252	1449	1692	1954	2200	2522	2860	3177	3535	4071	4816	5520	6355
155	600	721	835	1006	1180	1347	1552	1829	2106	2347	2681	3079	3426	3773	4369	5264	6157	7150
125	645	775	900	1078	1260	1438	1678	1973	2295	2493	2880	3327	3773	4270	4925	5958	6912	8143
100	695	835	968	1158	1355	1618	1888	2143	2485	2669	3081	3625	4171	4816	5561	6753	7745	....
84	733	881	1025	1223	1476	1745	2068	2333	2656	2992	3456	4071	4687	5412	6365	7706	....	....
68	786	953	1097	1321	1628	1935	2307	2599	3016	3433	3932	4667	5362	6256	7349	....	....	....
56	835	1006	1162	1405	1791	2125	2547	2924	3398	3853	4469	5264	6136	7150	8540	....	....	....
45	919	1101	1287	1549	1992	2371	2848	3341	3911	4429	5124	6057	7070	8282	....	....	....	....
37	999	1192	1405	1701	2202	2618	3151	3797	4461	5015	5809	6912	8043	....	....	....	....	....
30	1090	1306	1530	1880	2411	2914	3531	4310	5069	5720	6653	7944	....	....	....	....	....	....
25	1173	1416	1663	2050	2639	3187	3873	4841	5676	6434	7488	....	....	....	....	....	....	....
20	1295	1553	1638	2278	2924	3569	4367	5582	6545	7428	8639	....	....	....	....	....	....	....
16.5	1409	1686	2031	2487	3246	4025	4936	6284	7398	8381	....	....	....	....	....	....	....	....
13.5	1534	1881	2202	2753	3626	4556	5582	7113	8332	....	....	....	....	....	....	....	....	....
11.0	1671	2050	2449	3038	4025	5202	6341	8064	....	....	....	....	....	....	....	....	....	....
9.0	1868	2278	2715	3341	4651	5995	7342	....	....	....	....	....	....	....	....	....	....	....
7.5	2050	2525	3000	3740	5316	6892	8391	....	....	....	....	....	....	....	....	....	....	....
6.0	2316	2848	3360	4253	6227	8092	....	....	....	....	....	....	....	....	....	....	....	....
5.0	2563	3151	3683	4708	7100	9230	....	....	....	....	....	....	....	....	....	....	....	....
4.0	3019	3721	4348	5582	8271	....	....	....	....	....	....	....	....	....	....	....	....	....
3.2	3531	4367	5088	6531	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2.7	4025	4955	5790	7208	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2.2	4860	5733	6740	8573	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1.8	5411	6645	7765	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1.5	6200	7600	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
AGMA Class III																		
420	$ 662	$ 725	$ 802	$ 878	$1050	$1220	$1292	$1505	$1740	$2005	$2238	$2596	$2811	$3161	$3706	$4224	$4811	....
350	664	738	808	891	1069	1235	1401	1641	1890	2182	2465	2740	3026	3427	3940	4454	5024	....
280	668	764	847	956	1122	1270	1471	1698	1951	2269	2604	2855	3141	3597	4112	4682	5459	$6738
230	677	786	882	1022	1192	1362	1558	1833	2100	2395	2740	3083	3380	3826	4385	5093	5893	7034
190	681	808	922	1083	1270	1440	1667	1947	2248	2530	2900	3289	3654	4065	4682	5539	6348	7308
155	690	830	961	1157	1357	1550	1785	2104	2423	2699	3083	3540	3940	4339	5024	6053	7081	....
125	742	891	1035	1240	1449	1654	1930	2270	2641	2967	3312	3826	4339	4910	5664	6852	....	....
100	799	961	1114	1332	1558	1861	2171	2464	2859	3070	3543	4169	4797	5539	6396	....	....	....
84	843	1013	1179	1406	1698	2008	2378	2684	3055	3441	3974	4682	5391	6224	7308	....	....	....
68	904	1096	1262	1520	1873	2226	2654	2990	3470	3948	4522	5367	6167	7194	....	....	....	....
56	961	1157	1336	1616	2060	2444	2929	3363	3909	4430	5139	6053	7057	....	....	....	....	....
45	1057	1267	1481	1782	2292	2728	3276	3843	4498	5093	5893	6966	....	....	....	....	....	....
37	1149	1371	1616	1957	2533	3012	3625	4367	5132	5767	6680	....	....	....	....	....	....	....
30	1263	1502	1760	2162	2773	3352	4062	4957	5830	6578	7651	....	....	....	....	....	....	....
25	1350	1629	1913	2358	3035	3667	4455	5568	6529	7399	....	....	....	....	....	....	....	....
20	1489	1786	2114	2620	3363	4105	5022	6414	7530	....	....	....	....	....	....	....	....	....
16.5	1620	1839	2337	2881	3734	4629	5678	7228	....	....	....	....	....	....	....	....	....	....
13.5	1764	2140	2533	3166	4171	5241	6414	8181	....	....	....	....	....	....	....	....	....	....
11.0	1922	2358	2817	3494	4629	5983	7286	....	....	....	....	....	....	....	....	....	....	....
9.0	2149	2620	3123	3843	5350	6892	8447	....	....	....	....	....	....	....	....	....	....	....
7.5	2358	2904	3450	4302	6114	7927	....	....	....	....	....	....	....	....	....	....	....	....
6.0	2664	3276	3865	4891	7149	....	....	....	....	....	....	....	....	....	....	....	....	....
5.0	2948	3625	4236	5416	8156	....	....	....	....	....	....	....	....	....	....	....	....	....
4.0	3472	4280	5001	6420	....	....	....	....	....	....	....	....	....	....	....	....	....	....
3.2	4062	5022	5852	7513	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2.7	4629	5699	6660	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
2.2	5590	6595	7759	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1.8	6223	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
1.5	7100	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Gear End Modifications, Type U All-Motor Gearmotors

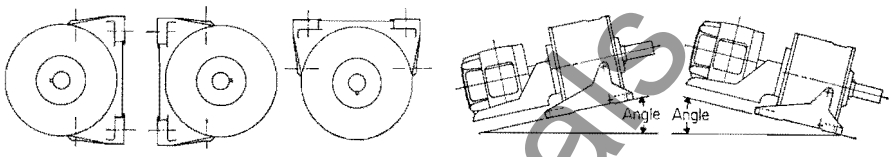
All prices shown are List Prices, Discount Symbol UM-1

1. Mounting Positions

There is no additional charge for mounting positions as shown at right. Indicate on order which position is to be used.

For positions other than those shown above, make the following list price additions.

Note: For applications involving shaft inclined up at greater than 10 degrees, refer to Westinghouse.



Right hand wall mounting	Left hand② wall mounting	Ceiling mounting	Output shaft up maximum 10 degrees	Output shaft down maximum 15 degrees

Mounting Position	Gear Size and List Price Addition								
	10	21	32	43	54	64	76	88	92
Vertical, shaft down (footmounted)③	$ 73	$ 87	$110	$139	$181	$222	$ 263	....	....
Vertical, shaft down (flange mounted)③	176	218	263	348	448	552	657	....	....
Vertical, shaft down (dry well)	....	....	....	612	781	....	1212	....	....

● Not available on sizes 88 and 92.

③ Moduline units running at 155 rpm or greater may run too hot with low speed shaft down, therefore the thermal hp capacity should be reduced by approximately 30 percent.

2. Special Shafts

Output shafts – gear end

Note: For special diameters larger than standard or low speed shaft extensions greater than 24 inches in length, refer to Westinghouse.

	Gear Size								
	10	21	32	43	54	64	76	88	92
	List Price Addition per Unit								
Basic addition									
0- 6" or modified	$189	$201	$222	$233	$258	$272	$300	$331	$351
6-24"	266	289	309	328	359	379	421	463	491

Quantity Discounts on Special Shafts

Quantity of Identical Shafts	1	2-4	5-24	25 or More
Discount	**0%**	**20%**	**40%**	**60%**

Basic Charges for Special Shafts include the special length, turning down the shaft to one special diameter and cutting a standard keyway. For additional shaft modifications, add the following percentages of the basic charge:

Drilling and tapping end of shaft . . . **add 20%**
Special keyway . . . . . **add 20%**
Splined shaft . . . . . **add 100%**
Special diameter, one is included in the basic charge, for each special diameter after the first . . . . **add 20%**
Tapered shaft with threaded end . . . . **add 50%**
Threaded shaft, for each set of threads . . . . . **add 20%**

Note: Regardless of the number of shaft variations from standard, add the basic charge only once.

3. Mounting Customer's Equipment

a. Pressing customer's material on output shaft (couplings, sprockets, pinions).

	Gear Size								
	10	21	32	43	54	64	76	88	92
List Price Addition	**$79**	**$82**	**$91**	**$95**	**$107**	**$112**	**$123**	**$136**	**$143**

Note: Customer's material must be delivered to Westinghouse, transportation prepaid and ready for mounting. Shipment must be marked for application to specific general order and item number. Any machining of customer's material must be negotiated with Westinghouse in advance of mounting. Westinghouse is not responsible for loss or damage to customer's material.

4. Backstops

	Gear Size								
	10	21	32	43	54	64	76	88	92
List Price Addition	**$241**	**$264**	**$292**	**$328**	**$365**	**$440**	**$830**	**$1269**	**$1269**

5. Couplings

a. Omission of coupling from input shaft:

	Gear Size								
	10	21	32	43	54	64	76	88	92
List Price Deduction	**$18**	**$22**	**$27**	**$33**	**$38**	**$43**	**$74**	**$100**	**$146**

b. Substitute couplings:
The standard Westinghouse coupling is used in the all-motor gearmotor. If a substitution is desired, refer to Westinghouse.

c. Coupling guards:

	Gear Size								
	10	21	32	43	54	64	76	88	92
List Price Addition	**$68**	**$75**	**$93**	**$101**	**$115**	**$115**	**$127**	**$144**	**$144**

Note: Coupling guards priced from this table meet OSHA standards, as designed for Westinghouse reducers and couplings.

Gear End Modifications, Type U All-Motor Gearmotors, Continued
All prices shown are List Prices, Discount Symbol UM-1

6. Mill and Chemical Features

	Gear Size								
	10	21	32	43	54	64	76	88	92
List Price Addition	**$22**	**$27**	**$33**	**$41**	**$56**	**$73**	**$87**	**$120**	**$142**

Note: Mill and Chemical features include wet end seals and green epoxy paint to match the Mill and Chemical motor.

7. Special Paint④

	Gear Size								
	10	21	32	43	54	64	76	88	92
List Price Addition	**$55**	**$66**	**$73**	**$90**	**$102**	**$102**	**$111**	**$128**	**$128**

④ Price applies to standard commercial paints available in one gallon cans.

8. Special Seals

	List Price Addition								
	Gear Size								
	10	21	32	43	54	64	76	88	92
Wet end⑤	**$22**	**$ 27**	**$ 33**	**$ 41**	**$ 56**	**$ 73**	**$ 87**	**$120**	**$142**
Taconite⑥	**98**	**124**	**161**	**197**	**262**	**326**	**394**	**663**	**844**

⑤ For moisture laden atmospheres (e.g., – wet end paper mill drives).

⑥ For Taconite dust, cement dust or other abrasive atmospheres. If atmosphere contains non-abrasive dust, no modification is necessary.

9. Slide Rails (pair)

	Gear Size								
	10	21	32	43	54	64	76	88	92
List Price Addition	**$94**	**$106**	**$106**	**$136**	**$136**	**$199**	**$242**	**$280**	**$322**

10. Export Boxing

Westinghouse approved under deck overseas packing.

Add 6% to total gear unit price, with a **$100 net minimum charge** for each gear unit.

11. Oil Sight Gauge: Add $22 list.

12. Reversing Duty: Refer to Westinghouse.

13. Special Output Speeds

The following gear ratios and output speeds are standard.

Double Reduction Gears	
Gear Ratios (Nominal)⑨	AGMA Full Load Output Speeds
1750 Rpm Motors	
4.134	420
5.062	350
6.200	280
7.594	230
9.300	190
11.39	155
13.95	125
17.09	100
20.93	84
25.63	68
31.39	56
38.44	45

Triple Reduction Gears	
Gear Ratios (Nominal)⑨	AGMA Full Load Output Speeds
1750 Rpm Motors	
31.39	56
38.44	45
47.08	37
57.66	30
70.62	25
86.50	20
105.9	16.5
129.7	13.5
158.9	11.0
194.6	9.0
238.4	7.5
1170 Rpm Motors	
194.6	6.0
238.4	5.0

Quadruple Reduction Gears	
Gear Ratios (Nominal)⑩	AGMA Full Load Output Speeds
1750 Rpm Motors	
194.6	9.0
238.4	7.5
291.9	6.0
357.5	5.0
437.9	4.0
536.3	3.2
656.8	2.7
804.5	2.2
985.3	1.8
1207.0	1.5

⑨ Actual ratios may vary ±4%.
⑩ Actual ratios may vary ±5%.

For ratios other than those listed, refer to the following table and make addition to the lower speed rating.

Quantity	**List Price addition per unit**
1-2	**$407**
3-24	**215**
25 or more	**No Charge**

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

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