Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Price List
3130

Page 1

February 21, 1977
Supersedes 3130 P WE A
Price List
pages 1 and 2, dated July 20, 1976
Prices effective February 21, 1977
subject to change without notice.
(Refer to Selling Policy 3000)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Alphabetical Index to Modifications

No change since previous issue.

Alphabetical Index, Continued

Discounts

All modifications in this section are subject to discount symbols W-7, W-7W.

Modification Symbols

Many of the modifications in this section require price adjustments which vary with the physical size of the machine. This, of course, is a function of both horsepower and speed. A **Modification Symbol** for each horsepower and speed rating is shown with the basic listed squirrel-cage prices in Price List 3120. This symbol is used to determine the price adjustment in many of the modifications.

Rules for Pricing

All price adjustments in this section are to be applied to the basic price obtained from Price List 3120.

The price adjustments called for by all of the various modifications in this section are "additive," not "cumulative." This applies to both percentage and dollar adjustments.

The percentage additions may be added together and applied as one total percentage adjustment to the base price. Percentage adjustments are figured to the nearest dollar. (Fifty cents becoming the next higher dollar.)

Non-Standard Ratings

The horsepower ratings listed are standard. Motors with non-standard horsepower may be quoted by using price of next higher listed standard rating. All modifications are based on the horsepower and speed which is used as a base.

Where a motor price is based on a listed larger or smaller rating, that rating must be used as the basis for figuring all adjustments for modifications.

Wound Rotor Adjustment Multiplier©

When applying percentage modifications, calculate the total percentage adders and multiply by the adjustment multiplier from the table below:

	Modification Symbol		
	D	E	I
	Adjustment Multiplier		
460 Volts	.45	.50	.55
2300 or 4160 Volts	.50	.50	.53

Example

Wanted: Wound rotor, 300 horsepower, 1800 rpm, three phase, 60 hertz, 4000 volts, totally enclosed fan cooled with stator RTD's and space heaters.

Use: Basic list price of 300 horsepower, 1800 rpm, three phase, 60 hertz, 2300 volt motor. . . . . **$16476D.**

4000 volts, Item 35 . . . . . **15%**

Totally enclosed fan cooled, Item 8G **90%**

105%

Adjustment multiplier . . . . . **x .50**

52.5%

Basic list **$16476**

x 1.525

$25126

Stator RTD's **600**

Space heaters **85**

Total list price **$25811**

W-7W

© Added since previous issue.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective February 21, 1977
subject to change without notice.
Discounts: Same as the motor being modified.

Printed in U.S.A.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 6. Corrosion Resistant Parts

Corrosion resisting hardware is furnished as standard.
For stainless steel guard screens, refer to Item 8B, 8J or 8K.

Item 7. Coupling End Play and Rotor Float for High Speed Motors

Motors and flexible couplings should be so arranged as to prevent thrust from being transmitted to the motor bearings and damaging them. Operating experience on motors has shown that sufficient thrust to damage motor bearings may be transmitted through a flexible coupling of normal design.

Damage to motor bearings due to driven machine thrust will be avoided if the following procedures are observed by the motor manufacturer and the driven machine and motor assembler:

1. The motor sleeve bearings and a limited end float coupling should be applied as indicated in the following table:

Motor Hp	Motor Speed Sync. Rpm	End-float in Inches	
		Motor Rotor Mini-mum	Cou-pling Maxi-mum
Up to 450	1800, 1200, 900	¼	3/32
Up to 450	3600, 3000	½	3/16
500 and Above	All	½	3/16

2. To facilitate the assembly of motor and driven machine, the motor manufacturer should:

(a) Indicate on the motor outline drawing the minimum motor end-play in fractions of an inch.

(b) Mark rotor end-play limits on motor shaft.

(c) Show maximum lathe center dimension on motor outline drawing.

3. Advise purchaser that the motor and driven machine should be so assembled that the thrust bearing in the driven machine will hold the motor rotor in such a way that there is some endwise clearance in the motor bearings under all operating conditions. The difference between the end float of rotor and coupling allows for expansion and contraction in the pump, for clearance in the driven machine thrust bearing and for endwise movement in the coupling, and for assembly.

Item 8. Enclosures

A. Dripproof
All ratings, **no charge.**

The ventilating openings of dripproof motors are so constructed that drops of liquid or solid particles falling on the machine at any angle not greater than 15 degrees from the vertical cannot enter the machine either directly or by striking and running along a horizontal or inwardly inclined surface.

B. Dripproof Guarded (Screens)
All ratings add as follows:
Modification Symbols D thru G, **add 2%.**
Modification Symbol I, **No Charge.**

In addition to the dripproof feature, motors with the designation "dripproof guarded" have all their ventilation openings limited in size and shape. Openings giving direct access to live or rotating parts shall not permit the passage of a cylindrical rod ¾ inch in diameter.

Insect screens may be furnished for a further list price addition of **1 percent.**

For special corrosion-resisting screens (such as stainless steel) make a further list price addition of **1 percent.**

C. Enclosed, Collector Rings
For enclosed collector rings on wound rotor motors, **add 10%.**

The collector ring enclosures furnished, for the list price addition at left, are suitable for either ventilated or nonventilated operation. When enclosure for forced ventilation is added to the motor price (Item 8D), the collector rings may be mounted inside the motor enclosure without the necessity of adding for collector enclosure.

Where motors are operated in an explosive atmosphere and non-explosive air pressure is maintained within the collector ring enclosure, no additional charge is required.

Item 8. Enclosures, Continued

D. Forced Ventilated (Pipe or Base)

	Modification Symbol			
	D	E	G	I
Percentage List Price Addition	**31%**	**21%**	**17%**	**12%**

The external fan or blower and ducts are not included in these list price additions.

These list price additions are used for a forced ventilated motor designed to operate only when furnished with forced cooling air from an external source. The same price addition is used for any arrangement of intake and discharge covers adapted for connection to ducts. Also the same price addition is used where covers adapted for duct connection are provided only for the intake air or only the discharge air.

For motor mounted ventilating blower including blower motor, for use with enclosed forced-ventilated motors, make further additions from the table below.

The addition includes the blower, and blower motor of the squirrel-cage type for 220, 230, 440, 460, 550 or 575 volts, mounting of the blower on the motor frame and the ductwork between the blower and the enclosing covers. When air filters are required add from items 41A and B.

Modification Symbol	**Percentage List Price Addition for Blower and Blower Motor②**	
	Standard Blower Motor	Explosion Proof Blower Motor and Non-Sparking Fan Wheel
D	**10.0%**	**12.5%**
E	**7.5%**	**10.0%**
G-I	**5.0%**	**7.5%**

② Starter for the blower motor is not included.

E. Splash-Proof

Splash-Proof enclosures are no longer available. For added protection it is recommended that Weather Protected Type I or II enclosure be used.

F. Top or Bottom Air-Discharge

	Modification Symbol			
	D	E	G	I
Percentage List Price Addition	**14%**	**12%**	**10%**	**9%**

Motors arranged for discharge of air against atmospheric pressure through the top or bottom of the stator frame. If the discharge is into duct-work of any kind, the purchaser is to furnish a suitable blower to overcome any back pressure present. List price addition does not include duct-work, blowers or filters.

When specified, guard screens on the air discharge opening can be furnished at no further list price addition.

G. Totally Enclosed Motors

1. Fan-Cooled Standard

For standard totally enclosed fan-cooled motors make additions as follows to prices given in price list 3120 P WE A. Totally enclosed fan-cooled motors for outdoor service can be furnished for the same price when specified. Motors priced by this rule have a temperature rise of 80°C by resistance.

For totally enclosed motors with overload (service factor) refer to item 22.

Note: TEFC motors marked with ② in price list 3120 P WE A, pages 13 and 15, are "Tube Type" TEFC construction. Standard tubes are aluminum. For non-standard tube material make further list price addition as follows:

Low Carbon Steel . . . . . **add $2250 list**
Copper . . . . . **add $3000 list**
304 Stainless Steel . . . . . **add $4500 list**
316 Stainless Steel . . . . . **add $6750 list**

List Price Additions for Totally Enclosed Fan-Cooled Motors – Standard

600 Volts or Less, All Speeds

	Modification Symbol		
	D	E	G
Percentage List Price Addition	**100%**	**100%**	**90%**

Above 600 Volts, All Speeds

	Modification Symbol		
	D	E	G
Percentage List Price Addition	**90%**	**80%**	**80%**

2. Explosion-Proof (Squirrel Cage Only)

To price explosion proof motors, make addition for totally enclosed fan cooled from table in paragraph G-1 (above) plus percentage addition shown in table at right for explosion proof motors.

Type	**Percentage List Price Addition**
Class I, Group D	**15%**
Class II, groups F and G③	**15%**

③ Class II, groups F and G motors are not available on sleeve bearing motors.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 8. Enclosures, Continued

H. Totally Enclosed Water-Air-Cooled

A totally enclosed water-to-air cooled machine is so enclosed as to prevent free exchange of air between the inside and outside of the case but not sufficiently enclosed to be termed air tight. It is cooled by circulating the internal air through a water-cooled heat exchanger for cooling the ventilating air and has a fan or fans mounted on the rotor for circulating the ventilating air. (NEMA MG1-1.26)

The motor is supplied with a heat exchanger mounted in the top of the motor. The heat exchanger tubes are 90% copper, 10% nickel, tube sheets and headers are of steel, and tube fins are aluminum. Cooler is designed for use with 80°F max. cooling water at a pressure not exceeding 50 psi (test at 75 psi) with a nominal fouling factor of 0.001.

Number of Poles	Modification Symbol			
	D	E	G	I
	Percentage List Price Addition			
2, 4	125%	100%	70%	45%
6 or more	125%	100%	70%	60%

For special cooler designs make the following price additions as well as those shown at left:

81°F to 85°F cooling water, **add 2 percent.**
86°F to 90°F cooling water, **add 4 percent.**
91°F to 95°F cooling water, **add 6 percent.**
96°F to 100°F cooling water, **add 12 percent.**

Water pressure over 50 to 100 psi (test at 150 psi) **add 1 percent.**

If cooler tubes of special metal such as special copper-nickel alloy or aluminum-bronze alloy specified, **add 1 percent.** For stainless steel tubes, **add 10 percent.**

Fouling Factor
For special fouling factor of not more than 0.002, **add 5%.**

Air Temperature Switch
For air temperature switch mounted in the cooled air stream, **add $250 list.**

Moisture Indicators
For moisture indicating equipment on enclosed machines with air cooler, including probes mounted in motor air stream, **add $700 list.**

Water Flow Indicator
Water flow indicator with alarm contacts for indicating gpm (water supply to air coolers), **add $500 list each.**

Water Regulating Valves
For thermostatically-controlled water regulating valves **add $2400 list each valve.**

Globe Valve
Globe valve for heat exchanger water supply line **add $300 list each valve.**

Solenoid-Operated Valve
Solenoid-operated valve for heat exchanger water supply line **add $1,600 list each valve.**

I. Waterproof Motors

For motors meeting NEMA definition MG-1-1.26E, built to exclude water applied in the form of a stream from a hose, **add 20 percent** to price of totally-enclosed, fan-cooled motor. Such special designs are not necessary for ordinary outdoor service, for which standard enclosed motors should be used.

J. Weather-Protected Type I

Number of Poles	Modification Symbol②		
	D, E	G	I
	Percentage List Price Addition		
2, 4	10%	6%	5%
6 or more	10%	6%	6%

② Motors must be priced using 2300 volt base price.

Weather-protected Type I motors have the minimum protection recommended for outdoor application. This includes screens, Thermalastic Epoxy insulation, protection of bearings, corrosion resistant treatment of hardware, fittings and internal parts, special attention to leads and space heaters when specified. For special corrosion-resistant screens (such as stainless steel) make a further **addition of 1 percent.**

For outdoor service, either the NEMA Type II (Item 8K) or totally enclosed fan cooled motor (Item 8G) is a much better protected and more conservative design for severe or critical applications.

NEMA Definition – MG 1-1.25H
A weather-protected Type I machine is an open machine with its ventilating passages so constructed as to minimize the entrance of rain, snow, and air-borne particles to the electric parts, and having its ventilated openings so constructed as to prevent the passage of a cylindrical rod ¾ inch in diameter.

Item 8. Enclosures, Continued
K. Weather Protected Type II

Number of Poles	Modification Symbol D	E	G	I
	Percentage List Price Addition			
600 Volts or Less				
All	**70%**	**50%**	**35%**	**30%**
Above 600 Volts				
2	**50%**	**50%**	**25%**	**10%**
4	**65%**	**45%**	**25%**	**10%**
6 or more	**60%**	**40%**	**25%**	**25%**

These motors are rated 80°C rise class B

Space heaters are recommended and furnished on NEMA Type II motors. No deduction can be made for omission of this feature.

For special corrosion-resisting screens (such as stainless steel) make a further **addition of 1 percent.**

NEMA Definition – MG 1-1.25H
A weather-protected Type II machine is an open machine with its ventilating passages so constructed as to minimize the entrance of rain, snow, and air-borne particles to the electric parts, and having its ventilation openings so constructed as to prevent the passage of a cylindrical rod ¾ inch in diameter. The ventilating passages at both intake and discharge shall be so arranged that high-velocity air and air-borne particles blown into the machine by storms or high winds can be discharged without entering the internal ventilating passages leading directly to the electric parts of the machine itself. The normal path of the ventilating air which enters the electric parts of the machine shall be so arranged by baffling or separate housings as to provide at least three abrupt changes in direction, none of which shall be less than 90 degrees. In addition, an area of low velocity not exceeding 600 feet per minute shall be provided in the intake air path to minimize the possibility of moisture or dirt being carried into the electric parts of the machine.

Item 9. Extra Leads
For three extra leads required for differential protection, Y-Delta connection, neutral reactor starting: no addition.

For six or seven extra leads for series parallel (dual voltage) **add 1 percent.**

For nine extra leads for special voltage combinations **add 2 percent.**

The motor price in the above addition must be based upon the voltage involving the higher price. If it is desired to have extra leads for a 2300 or 4000-volt motor, price should be based on 4000 volt rating. For lower voltages care should be taken to note the limitations in Item 35.

The neutral lead only will be brought out without extra charge when requested.

See Item 51 and make additions for special terminal box where required.

Item 10. Export Boxing
For standard commercial export boxing **add 6%** to the final motor or spare parts price. For special packing as required by Government or other special specifications, refer to Westinghouse.

Item 11. Frequency, Non-Standard
A. 50 Hertz Motors
For motors for use on 50 Hertz power systems, use the basic listed price and modification symbol of a 60 Hertz motor of the same horsepower and same number of poles and . . . . . **add 25%**

B. Other Frequencies
For other frequencies, dual frequency, or adjustable frequency, refer to Westinghouse.

$$\text{Number of Poles} = \frac{120 \times \text{Frequency}}{\text{RPM}}$$

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice. Discounts: Same as the motor being modified.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 12. High Inertia Drives (Squirrel Cage Motors)
(Involving More Than Normal Load WK²)

The following "Table a" lists load WK² which squirrel cage motors, having performance characteristics in accordance with parts 14 and 20 of NEMA M and G Standards, can accelerate without injurious temperature rise under the following conditions.

1. Applied voltage and frequency within the limits in NEMA MG1-20.45.

2. During acceleration, the connected load torque is equal to or less than, a torque which varies as the square of the speed and is equal to 100% of full load torque at rated speed. (Fan curve)

3. Two starts in succession (coasting to rest between starts) with the motor initially at ambient temperature or one start with the motor initially at a temperature not exceeding its rated temperature.

For applications whose load WK² (at the motor shaft – see note below) exceeds normal, **add 1 percent** to the basic motor price for each 10 percent or fraction thereof above normal WK².

Note: Load WK² is the inertia of the driven element expressed in pounds-feet squared at the motor shaft. If the speed of the load differs from that of the motor shaft (as in the case of belt, gear, or chain drives), the WK² of the driven element together with its pulley sheave, gear or sprocket must be multiplied by the $\left(\frac{\text{speed of driven element}}{\text{speed of motor shaft}}\right)^2$

Note: Values of load WK² will be reduced for motors having high temperature rise built in frames smaller than standard and where the load torque values exceed fan-type load (where the load torque requirements vary as the square of the speed).

Table a: Values of Normal WK² of Load – Exclusive of Motor WK²

Motor Rating Hp.	Synchronous Speed Rpm												
	3600	3000	1800	1500	1200	1000	900	750 720	600	514 500	450 429	400	375 360
	Number of Poles at 60 Cycles												
	2	..	4	..	6	..	8	10	12	14	16	18	20
	Normal Value of WK² of Load in Pounds-Feet Squared												
75	....	....	....	....	....	.....	.....	.....	4823	7020	.....	.....	.....
100	....	....	....	....	....	.....	.....	4070	6325	9192	.....	.....	.....
125	....	....	....	....	....	.....	2918	5013	7784	11328	.....	.....	.....
150	....	....	....	....	.....	.....	3454	5934	9236	13429	.....	.....	.....
200	....	....	....	....	2238	3489	4505	7753	12066	17554	.....	.....	....
250	210	329	1017	1590	2744	4282	5540	9530	14830	21560	29800	39640	51200
300	246	387	1197	1874	3239	5060	6540	11270	17550	25530	35300	46960	.....
350	281	443	1373	2152	3723	5820	7530	12980	20230	29430	40710	54200	.....
400	315	497	1546	2425	4199	6570	8500	14670	22870	33280	46050	.....	....
450	349	550	1714	2692	4666	7300	9460	16320	25470	37090	51300	.....	....
500	381	602	1880	2955	5130	8030	10400	17970	28050	40850	56600	.....	...
600	443	703	2202	3467	6030	9450	12250	21190	33110	48260	.....	.....	.....
700	503	800	2514	3964	6900	10840	14060	24340	38080	.....	.....	.....	.....
800	560	893	2815	4447	7760	12200	15830	27440	42950	.....	.....	.....	.....
900	615	982	3108	4918	8590	13520	17560	30480	47740	.....	.....	.....	.....
1000	668	1069	3393	5380	9410	14820	19260	33470	.....	.....	.....	.....	.....
1250	790	1273	4073	6480	11380	17980	23390	40740	.....	.....	.....	....	....
1500	902	1461	4712	7520	13260	21000	27350	.....	.....	.....	.....	.....	....
1750	1004	1635	5310	8510	15060	23900	31170	.....	.....	.....	.....	...	.....
2000	1096	1796	5880	9450	16780	26700	.....	.....	.....	.....	.....	.....	.....
2250	1180	1945	6420	10350	18440	29400	.....	.....	.....	.....	.....	.....	.....
2500	....	....	6930	11210	.....	.....	.....	.....	.....	.....	.....	.....	...

Item 13. Horsepower, Non-Standard

The horsepower ratings listed are standard in accord with NEMA. Motors with non-standard horsepower ratings should be quoted by using the price of the next higher listed standard ratings.

Item 14. High Slip Motors

For high slip NEMA Design D motors add as follows:

5- 8% Slip . . . . . **add 35 percent**
8-13% Slip . . . . . **add 65 percent**

Complete details must be referred to Westinghouse for checking and approval before quoting.

Item 15. Induction Generators

To price induction generators proceed as follows:

Only standard generator kilowatt ratings will be quoted, and list price will be the same as the equivalent motor hp rating as shown in the following table:

Generator Kw	Motor Hp
200	300
250	350
300	400
350	500
400	600
500	700
600	800
700	1000
800	1250
900	1250
1000	1500

For generator ratings larger than those listed obtain the equivalent motor hp rating as follows:

For 80°C rise by resistance generators –

$$\text{the equivalent motor hp} = \frac{\text{generator kw rating}}{0.746}$$

The price of the induction generator will be the same as the price of the equivalent motor hp rating using the next higher listed hp rating if the equivalent hp is not a standard rating.

Induction generator list price will be subject to the same discount as the motor from which it is derived.

This generator is not suitable for waterwheel drive.

Item 16. Inspection, Customers

A. No price addition is required for visual surface inspection of completed motor by customers inspector.

B. When inspection also requires motor to be run at no load add for commercial witnessed test from item 32, table a.

C. When visual inspection of parts prior to assembly or at time of assembly is required, **add $4000 list** for each such inspection.

Westinghouse will notify customer when motor will be ready for inspection at least 48 hours prior to scheduled availability for inspection.

Note: When inspection is required, it must be shown as a separate item on order for each motor to be inspected.

Item 17. Insulation

Class B – Standard
Class B insulation with normal Class B temperature rise as given in Item 31A is standard for all motors.

Class
Class A insulation is no longer available.

Class F
No price addition is required for Class F insulation on machines with normal Class F temperature rise as given in Item 31A.

Abrasion Treatment
For applications specifying a particularly abrasive atmosphere, such as flyash, a special resilient elastomeric outer coating can be furnished, when specified, **add 1 percent.** This treatment is not required for enclosed motors such as TEFC, explosion proof, or enclosed with coolers.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 17. Insulation, Continued
Types of Class B Insulation Systems
Ratings shown in Price List 3120 P WE A, pages 3 and 4.

Class B insulation is standard on random wound motors; Class B Epoxy shielded insulation is standard on form wound motors. When a sealed insulation system is required, add for Thermalastic® Epoxy insulation from table at right. When added moisture protection on **random wound** motors is desired, but a sealed insulation system is not required, add for premium shielded insulation per table below.

Type of Winding	Modification Symbol	Type of Insulation	List Price Addition
Random Wound	D-I	Premium Shielded	5%⑦
Form Wound	D-E	Thermalastic Epoxy	5%⑧
Form Wound	above E	Thermalastic Epoxy	3%⑧

⑦ Add to 460 volt motor list price
⑧ Use 2300 volt motor list price, for motors 600 volts and less thru 500 hp

Item 18. Intermittent Duty
(Short Time Rated Motors) 200 Hp and Smaller
Make price additions as follows:

Time Rating in Minutes	Service Factor	Motor Type: Open	Open Multispeed	TEFC	TENV	List Price Adjustment
60	1.15	Squirrel cage (Nema A, B or C) wound rotor				Use continuous rated motor price of type required.
60	1.0	Squirrel cage (Nema A, B or C) wound rotor	Squirrel cage (Nema A, B or C)			**Deduct 10 percent** from continuous rated motor price of type required.
60	1.0	Squirrel cage hoist				**Deduct 15 percent** from continuous rated high torque high slip motor.
60	1.0	Wound rotor hoist				**Deduct 10 percent** from continuous rated wound rotor motor.
60	1.0		Squirrel cage hoist			**Add 10 percent** to continuous rated multi-speed normal torque motor of same rating. (constant hp and constant torque motors only)
60	1.0			Squirrel cage (Nema A, B, C or D)		**Deduct 20 percent** from continuous rated motor price of type required and add for TEFC construction.
60	1.0				Wound rotor hoist	**Add 7½ percent** to continuous rated wound rotor open motor and add for enclosure from table below.
30 or 15	1.0	Squirrel cage (Nema A, B or C) wound rotor	Squirrel cage (Nema A, B or C)			**Deduct 12½ percent** from continuous rated motor of type required.
30 or 15	1.0	Squirrel cage hoist				**Deduct 20 percent** from continuous rated 8-13 percent slip motors.
30	1.0				Wound rotor hoist	**Deduct 10 percent** from continuous rated wound rotor open motor and add for enclosure from table below.
15	1.0				Squirrel cage hoist	**Deduct 20 percent** from continuous rated 8-13 percent slip open motor and add for enclosure from table below.

Addition for TENV Construction

	Modification Symbol	
	D	E
Percentage List Price Addition	**6%**	**5%**

Item 19. Multi-Speed Motors

Multispeed, Squirrel Cage Open Motors, 4 to 20 Poles (for Motors Having Other than 4 to 20 Poles or Wound-Rotor Multispeed Motors, refer to Westinghouse).

These motors will be classified according to speed combinations as follows:

a. One-winding, two-speed motors with 2 to 1 speed combination such as 6/12 or 10/20 poles. If a two-winding motor is preferred for a 2 to 1 speed combination use paragraph (b).

b. Two-winding, two-speed motors with speed combinations other than 2 to 1, such as 12/16 poles.

c. Two-winding, three or four-speed motors, each winding of which may be arranged for 2 to 1 speed combinations such as 6/12 – 8/16 poles.

Type	Variable Torque	Constant Torque	Constant Hp.
	Add to Price Motor of Same Hp. at:		
	Top Speed		Low Speed
1 Winding 2 Speed	70%	105%	70%
2 Windings 2 Speed	130%	185%	130%
2 Windings 3 or 4 Speed	140%	195%	140%

Pole Amplitude Modulation Multi-Speed Motors

Multi-speed pole amplitude modulation motors are available as two, three or four-speed ratings, either variable torque, constant torque or constant horsepower. These motors are single-winding machines for two and possibly three speeds. Two windings are required for four speeds. Refer to Westinghouse for prices.

Item 20. Noise (Sound) Levels.

Sound levels for Life-Line D motors are shown in **Table a.** Levels are shown for the standard Life-Line D motor by enclosure type, frame series and number of poles. The Life-Line D has the capability of being accoustically modified to achieve lower than those levels shown as standards. Sound levels for the accoustically modified Life-Line D motors are also shown.

1. Typical Sound Levels

The mean sound pressure levels shown in **Table a** are typical of either a standard horizontal Life-Line D or accoustically modified Life-Line D. **The values shown are overall "A" scale weighted and are given in db re 0.0002 dynes/cm², one meter from the major motor surfaces at no load.** Noise tests for sound power determination are made in accordance with IEEE #85, "Test Procedures for Air-Borne Noise Measurements on Rotating Electric Machinery." The mean sound pressure level at one meter is calculated from this Sound Power data. Motors that have the same overall "A" scale level don't necessarily have the same octave band sound pressure levels; therefore, the factory must be consulted if octave band data for a particular motor is required. If the accoustically modified sound levels are required, use price additions listed in **Table b.**

2. Guaranteed Sound Levels

If accoustically modified sound levels are required to be guaranteed to meet a customer's specification, use the price addition shown in **Table b.**

When tests are specified to confirm either standard or accoustically modified motor sound levels, refer to item 32C for price addition for sound test.

Table a: Sound Levels

Frame Series	Enclosure②	2 Pole		4 Pole		6 Pole		8 Pole	
		Std. Motor	Mod. Motor	Std. Motor	Mod. Motor	Std. Motor	Mod. Motor	Std. Motor	Mod. Motor
5000	ODP & WPI	95	80	90	85	85	80	85	80
	WPII	90	80	85	80	80	80	80	80
	TEFC	95	③	90	③	90	③	85	③
5800	ODP & WPI	95	80	90	85	85	80	85	80
	WPII	95	80	90	80	85	80	85	80
	TEFC	95	③	95	③	90	③	85	③
6800	ODP & WPI	95	80	95	90	85	80	85	80
	WPII	95	80	90	80	85	80	85	80
	TEFC	100	③	95	③	95	③	90	③

Table b: List Price Additions③ ODP, WP-I or WP-II

Frame Series	2 Pole	4 Pole	6 Pole & Slower
	Mod. Motor	Mod. Motor	Mod. Motor
5000	**$1250**	**$600**	**$200**
5800	**1500**	**750**	**750**
6800	**1500**	**750**	**750**

② Refer to Westinghouse for enclosures not shown.
③ For lower sound levels refer to Westinghouse. Reduction of sound levels on some ratings may not be practical.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

Printed in U.S.A.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 21. Obsolete Motors

Oversize Frames and Obsolete Motors
For motors which customer specifies on frames that are currently available but not presently assigned to the rating, price motor on basis of lowest horsepower motor of same number of poles presently assigned to that frame. Consideration should be given to standard rating with adapter. Refer to Westinghouse before quoting. For motors specified on obsolete frames, refer to Westinghouse.

Item 22. Overloads (Service Factor)

Motors operated at overload conditions will have changes in performance characteristics from rated load guarantees. When operating at any load greater than 1.0, they may have different efficiency, power factor and speed than at rated load, while the locked rotor torque, inrush, and breakdown torque will remain unchanged.

Continuous and Two Hour
For motors having 15 percent continuous overload or 25 percent overload for two hours make price addition as shown in **Table a.** Motor temperature rise rating will be at overload condition only. See Item 31, **Table a** for temperature rise.

Table a

Type Motor	Overload		
	15% Continuous③	25% Continuous	25% Two Hours②
	Percent List Price Addition		
All motors except TEFC	8%	18%	12%
TEFC	12%	22%	18%

② Motor is capable of 25 percent overload for two hours following continuous operation at rated load. Motor must be run for at least 30 minutes at or below normal rated load before overload can be repeated.

③ Open motors 200 hp and below, 2 pole thru 14 pole are standard with Class B insulation, 1.15 service factor, and are rated 90°C rise by resistance at the overload conditions.

Item 23. Paint, Special

For special paint limited to those kinds that are available in gallon quantities, **add $250 list.** For special paints requiring special preparation and/or finished processes, refer to Westinghouse for cost and availability.

Item 24. Partial Motors

A – Engine Type Parts③
For engine type parts consisting of rotor and stator only, **deduct 10 percent** from basic price of 2-bearing coupled motors. Stator sole plates are included if necessary.

The individual parts are deducted as follows:

Omission of	Percentage Price Deductions
Shaft only	1.5 %
One bracket and bearing	4.25%
One bracket only	3 %
One bearing only	1.25%
	10 %

B – Close Coupled Compressor Drives③
All inquiries for these motors should be referred to Westinghouse before quoting. Price as follows:

Engine type (without shaft or bearings) with round frame and straight rotor bore. Use two-bearing price without deduction since these motors require special flange machining, special test set-up and usually special consideration of rotor WK^2.

Add for the following as required: –
For tapered rotor bore . . . . . **add 3%④**
For dummy end bracket or screen on one end . . . . . **add 3%④**
For end bracket with anti-friction guide bearing and stub shaft . . . . . **add 5.75%④**

③ These motors are installed on and become an integral part of the driven machine. Westinghouse will not be responsible for the successful operation of these motors purchased by anyone other than the Manufacturer of the driven machine or his duly authorized agent and/or assembler.
④ Percentage of two-bearing basic price.

Item 25. Shafts

Special Extension
For straight shaft extensions having other than standard dimensions make additions from the table below.

The increase in length over standard extensions can be made at either or both ends within the limit stated

Any deviation from standard shaft extension will increase the price of the motor by at least the amount shown for a 15" extension.

It is not necessary to make a price addition for shaft extension on two-bearing motors for belted service because, in these cases the shaft will be made to fit the pulley or sheave that is being used.

Where extensions in excess of standard lengths are used without outboard bearings or in any manner that would place abnormal stress on the bearings, refer the application to Westinghouse for recommendations.

Increase in overall length beyond standard.	Modification Symbol			
	D	E	G	I
	Percentage List Price Addition for Any Deviation from Standard Shaft			
15 inches or less	3.0%	3.0%	2.0%	2.0%
Tapered or threaded shaft	3.5%	3.0%	3.0%	2.5%

Double Extended Shafts
Motors may be equipped with double extended shafts of standard length at price additions shown in the table for 15" extension.

Short Shafts
The additional charge for special short shafts will be the same as for the 15" extension given in the table.

Tapered Shafts
For machining the taper on a shaft and supplying a nut and lock washer for shafts, make additions from table below.

Drill Shaft for Air Clutch
For machining hole in shaft for use with air clutch, add same percentage as listed in table below for tapered shaft.

Item 26. Spare Parts

The following price additions will apply for spare parts, only when these parts are entered on the same order and manufactured at the same time as the motor.

Spare Wound Stator and Frame, add as follows:
(a) Squirrel Cage . . . . . **add 60 percent**
(b) Wound Rotor . . . . . **add 50 percent**

Note: The above percentage price addition is the percentage of that portion of the total motor list price obtained after adjustments are made for modification Items 1, 8G, 11, 12, 14, 17, 19, 22, 27, 29, 31, 33 and 35 **plus** any accessories built into the stator such as space heaters, stator RTD's, Thermocouples, Thermoguard, Guardistor, etc.

Spare Rotor and Shaft, add as follows:
(a) Squirrel Cage . . . . . **add 30 percent**
(b) Wound Rotor . . . . . **add 40 percent**

Spare Bearings
For one set (2) of anti-friction or sleeve bearings **add 5%.**

Item 27. Specific Applications

A. Chipper Drives②
Generally motors used to drive chippers require heavy duty mechanical construction, special bracing of stator winding, 250 percent pull out torque, and special thermal capacity rotor construction for inertia up to 175 percent of normal.

Add 20 percent for chipper construction including all of above features.

For motor where load inertia exceeds 175 percent of normal, refer to item 12 for price addition.

② Stator thermal protection is recommended for this service and price additions for this feature must be made where required.

B. Close-Coupled Compressor Motors
This application is covered under partial motors, item 24B.

C. Rubber Industry Motors
Motors for application on rubber mill equipment such as Banbury Mixers, plasticators, pelletizers, mills, crackers, refiners, strainers, etc., generally require 125 percent starting torque and 250 percent pull out torque (at rated torque), **add 15 percent** for this requirement.

For special insulation, see item 17.

For underwater test, see item 32D.

D. Metal Rolling Mill Motors
Refer to Westinghouse.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 27. Specific Applications, Continued

E. Hydraulic Dredge Motors

Cutter Motors

Use price of standard open motor from Price List 3120 P WE A and make following additions:

Type Motor	Percentage Addition
Deck Mounting (5-degree tilt, 3-degree roll) includes sleeve bearings	5%
Ladder mounting (45 degree tilt) includes anti-friction bearings.	10%

Cutter motors are generally of wound rotor type and require special speed reduction on constant torque basis, refer to item 28 for price addition. Generally forced ventilated motors with motor-mounted blower are required for this service, make price addition per item 8D.

Pump Motors

1 hp/rpm and smaller – Use prices from Price List 3120 P WE A and make adjustments for any required modifications.

Above 1 hp/rpm – Use prices of mill type motor obtained from Westinghouse, and make adjustments for any required modifications.

Pump motors are generally of wound rotor type and require special speed reduction on constant torque basis, refer to item 28 for list price addition.

F. Mine Hoist, Wound Rotor Motors, Plugging Duty

For wound rotor motors for hoist or plugging duty service, refer to Westinghouse for list prices.

Intermittent Ratings – Refer to item 18.

Plugging Switch – For a "plugging switch" (or zero speed switch) mounted on the motor add from item 48.

G. Metal Shredder Drives (Hammer Mills)

These drives are used for shredding scrap metal such as auto bodies, refrigerators, etc., and require heavy duty construction.

Rotor has special thermal capacity and specially swaged. Motor designed for up to 150 percent starting torque and 250 percent pull out torque. **Add 25 percent.**

When special pull out torque (item 33A) and high inertia (item 12) are specified make separate addition for these items.

H. Nuclear Power Station Motors

Motors for Nuclear Power Stations must be priced from Electric Utility Price Lists 4120 P WE A and 4130 P WE A.

Item 28. Speed Reduction on Wound Rotor Motors – Except 2-Pole

Wound rotor motors up through 900 horsepower, 500 through 1800 rpm, may be operated continuously at reduced speed with non-injurious heating. The table at right shows percent speed and percent torque relation with list price percentage additions.

Percent Speed	Percent Rated Load Torque		
100	100	115	125
70	85	100	110
50	60	80	100
Percentage Addition	**0%**	**8%**	**28%**

Note: Where 115 percent load (service factor) is standard **deduct 8 per cent** from adders shown in table.

Item 29. Starting Conditions

A. Starting Current

If starting current lower than standard is specified for an open squirrel cage motor, make price additions from table at right: (Breakdown torque and starting torque will be reduced.)

Starting Current	Up Through 250 Hp.	Above 250 Through 500 Hp.	Above 500 Hp.
	Percentage List Price Addition		
NEMA Code E (4.5-5.0 Kva. per Hp.)	7½%	7½%	Refer to Westinghouse
NEMA Code D (4.0-4.5 Kva. per Hp.)	10%	10%	
NEMA Code C (3.55-4.0 Kva. per Hp.)	15%	Refer to Westinghouse	

Open motors are normally Design B, NEMA Code F (5.6 Kva/Hp). Totally enclosed fan cooled and explosion proof motors are normally Design A, NEMA Code G (6.3 Kva/Hp).

Note: If NEMA Design B, Code F or lower, is required on TEFC or explosion proof motors, refer to Westinghouse.

Note: A motor with locked Code F of 5.6 Kva/Hp may exceed 650% inrush yet, because of the higher values of efficiency and power factor, have lower inrush in amperes than another motor rated 650% inrush current.

B. Starting Below Rated Voltage

Standard motors are capable of accelerating the normal load WK^2 as listed in Item 12 under starting conditions as defined with not less than 90 percent of rated voltage at the motor terminals.

When load WK^2 is not more than ½ of the NEMA normal values and where the load torque varying as the square of the speed does not exceed 60 percent of motor rated torque during the acceleration period, no price addition is required for terminal voltage down to 70 percent of rated.

For starting at voltages below 90 percent of rated voltage, make price additions as follows:

Below 90 percent down to 80 percent of rated voltage **add 2 percent.**

Below 80 percent down to 70 percent of rated voltage **add 7½ percent.**

Below 70 percent down to 65 percent of rated voltage **add 12 percent.**②

② Refer to Westinghouse for approval.

If the motor is to accelerate a load WK^2 greater than normal, price additions for it should also be made as given in Item 12.

Note: When acceleration time at reduced voltage condition is specified, refer to Westinghouse.

Note: For reduced voltage starting conditions the actual torque available at starting varies approximately as the square of the percent starting voltage. Consequently, a price addition may be necessary for higher starting torque. For example, if 100 percent starting torque is necessary and only 80 percent voltage is available at starting, the actual design starting torque must be:

$$\frac{100\%}{(.8)^2} = \frac{100\%}{.64} = 156\% \text{ starting torque (at 100\% voltage)}$$

This requires a price addition per Item 23.

Motors designed for starting at voltages below 90 percent of rated voltage, when operated at rated voltage, may have inrush currents somewhat higher than standard motors.

C. Number of Starts

Squirrel cage motors are designed for full voltage starting. With the motor initially at ambient temperature, it may be started twice in succession, coasting to rest between starts, or
with the motor running at full load operating temperature, it may be stopped, coasting to rest, and restarted immediately, providing the load inertia, the load torque during acceleration, the voltage and the method of starting are those for which the motor was designed.

If more frequent starting is required, refer to Westinghouse with full details.

D. Part-Winding Starting

A motor for part-winding starting is provided with a special multiple-circuit winding. In starting, one or more of the circuits, comprising only part of the complete winding, are first connected to the power supply. After the motor has accelerated, the remainder of the winding is energized in one or more steps. The result is to reduce the starting current and starting torque of the motor, simulating the effect of reduced voltage starting.

It is not possible to design all motors for part-winding starting. Whether or not a particular machine can be so designed depends upon the rating (hp., rpm., and voltage), torque, and starting current requirements of the application. All quotations on motors of this type must be referred to Westinghouse for approval with the following information.

1. Hp, rpm, voltage.
2. Load inertia at motor shaft.
3. Speed vs. torque curve of driven unit.
4. Inrush limitation.
5. Voltage at motor terminals.
6. Whether or not motor must accelerate load on starting connection.

Note: (Refer to NEMA MG1-14.36)
When approved, **add 3%** for this feature.

Item 30. Tandem Motor Drives

For two motors which will be operated coupled together to drive a common load from one end of one motor, including coupling, but not including common bedplate, **add 2.5 percent** to the list price of each motor.

(Motors will be shipped uncoupled, but with coupling halves pressed on shafts.)
For both motors coupled together and mounted on common bedplate **add 7.5 percent** to the basic list price of each motor.

Note: This does not include the coupling to the driven load.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

Printed in U.S.A.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 31. Temperature Rise and Ambient Temperature

A. Temperature Rise – Normal

The normal temperature rise for all induction motors with different classes of insulation is given in **Table a,** below, based on 40°C ambient temperature.

Table a: Normal Temperature Rise (40°C Ambient)

Motor Loading (All Enclosures)③	Ratings	Insulation Class B	Class F
		Temperature Rise °C Resistance②	
Continuous Rated 1.0 Service Factor	All	80	105
Motors with overload capability④	All	90	115
		Temperature Rise °C Embedded Detector	
Continuous Rated 1 0 Service Factor	1500 hp and less	90	115
	over 1500 hp, 6900 volts and less	85	110
Motors with overload capability④	1500 hp and less	100	125
	over 1500 hp, 6900 volts and less	95	120

② Temperature rise by thermometer is obsolete and is not recognized by NEMA.
③ Provided cooling water is supplied in adequate volume at temperature and pressure specified by Westinghouse for motors with air-to-water heat exchangers
④ Motors with overload capability require price additions, refer to item 16, except open motors 200 hp and below, 2 pole thru 14 pole which are standard with Class B insulation, 1.15 service factor

B. Temperature Rise – Below Normal

For motors specified, with temperature rise below the normal temperature rise listed in **Table a,** make price addition as shown in **Table b.**

Table b: Below Normal Temperature Rise (40°C Ambient)

Temperature Rise °C Below Normal Listed in Table a		**Percentage List Price Addition**
Insulation System		
Class B	Class F	
0	0	**0%**
10	10	**5%**
20	25	**12%**
30	40	**20%**

C. Ambient Temperature 40°C and Above

Standard motors are based on operation in an ambient temperature of 40°C. For operation in a higher ambient without exceeding temperature limitations of the bearing lubrication system or the winding insulation system it is necessary to build the motor with special consideration of the bearing design and with lower than normal temperature rise. Price additions for ambient temperature above 40°C are listed in **Table c.**

Table c: Ambient Temperature 40°C and Above

Ambient Temperature °C		Temperature Rise °C Below Normal Listed in Table a⑥		**Percentage List Price Addition**
Insulation System				
Class B	Class F	Class B	Class F	
40	40	0	0	**0%**
50	50	10	10	**5%**
60	65	20	25	**12%**
70	80	30	40	**20%**

⑥ If further reduction in temperature rise is required at a given ambient, make further addition from Table b

D. Ambient Temperature Lower than 40°C

Although the usual range of ambient is considered to be from 0 to 40°C, with proper attention to lubricants most motors can be run in ambients down to −18°C without factory modification. For motors to operate below −18°C refer to Westinghouse for availability, cautions and qualifications.

Item 32. Tests
Each motor is given such tests as may be deemed essential by the Corporation but not necessarily a complete test.

When complete or witness tests are required, they must be specified when the motor is ordered.

A – Standard Commercial Test
Each motor, when completed, is given a test per NEMA MGI-20.46 to prove freedom from electrical or mechanical defects and provide assurance that it meets design specifications.

This test consists of the following:
No-load running current and power②
Check current balance②
Measure winding resistance
High potential test
Vibration test per NEMA MGI-20.53

② This test will not be taken on motors without complete shaft and bearings

For wound rotor motors, measure secondary volts at collector rings.

If a standard commercial test witnessed is desired, make additions as shown in **Table a.** An initial commercial test described above must be made in all cases. A re-test is, therefore, necessary when a witness test is specified.

B – Complete Initial Test
Motors Manufactured at Buffalo Plant:
See **Table a** for price additions.

This test will be taken only upon request. It consists of Standard Commercial Test **plus** the following:
Full load heat run
Percent slip
No-load running current
Checking of current balance
Pull out torque
Locked rotor current
Starting torque
Efficiency at full, ¾ and ½ load
Power factor at full, ¾ and ½ load
Winding resistance measurement
High potential test
Check for bearing noise②

② If the motor must be dismantled to inspect bearings, add ½ of the commercial test witnessed price.

And for wound-rotor type the measurement of secondary volts at collector rings.

If a complete initial test witnessed is desired, make additions as shown in **Table a.**

A complete initial test must be made in all cases prior to witnessing of this test by customer's representative.

A complete re-test is, therefore, necessary when witness test is specified.

Table a

Hp Rating	List Price Addition		
	Commercial Test Witnessed	Complete Initial Test	Complete Initial Test Witnessed
Up to 500	$ 750	$2500	$3750
501 to 1500	1000	3000	4500
1501 to 2500	1250	4000	6000

When tests are required on multi-speed motors, the price addition should be based on the hp at the top speed. See following:

For tests at 1 speed **use 100 percent** of constant speed test charge.

For tests at 2 speeds **use 150 percent** of constant speed test charge.

For tests at 3 speeds **use 200 percent** of constant speed test charge.

For tests at 4 speeds **use 250 percent** of constant speed test charge.

C – Sound Test
Sounds tests will be conducted in accordance with the latest revision of IEEE #85 Test Procedure for Air-Borne Noise Measurements on Rotating Electrical Machinery. However, individual customer specifications differ in types and definition of readings, instrumentation, scales, etc., and they must be reviewed prior to quotation. The prices shown in table below are based on Westinghouse standard sound test procedure.

Horsepower	List Price
Up to 500	$ 750
501 to 1500	1000
1501 and above	1250

If sound test is to be witnessed, double prices in table above.

D – Water Immersion Test
When purchaser specifies under-water test of complete stator at 115 percent of rated voltage, **add 5 percent.**

E – Tandem Motor Test
Refer to Westinghouse.

F – Test Voltages
The standard IEEE test procedure number 112A specifies the stator winding test voltage as twice-normal plus 1000 volts.

When special high potential test voltages are specified, price the motor as if its nameplate voltage is for that voltage from which the test voltage is derived.

Example: A 2300-volt motor to have insulation to withstand a high potential test of 9500 volts. Following the IEEE test procedure, 9500 volts minus 1000 volts divided by 2 equals 4250 volts. This motor will be priced as if the nameplate voltage is 4250.

Printed in U.S.A.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Modifications

Item 33. Torque

A. Pull Out Torque

The following table lists the percentage list price addition for pull out torque which can be supplied when specified.

Pull Out Torque	Percentage List Price Addition
Up to 175%	None
Over 175% to 210%	2%
Over 210% to 250%	5%
Over 250% to 300%	15%
Over 300% to 350%	30%
Over 350% to 400%	45%

B. Reduced Voltage Operation (For Starting Below Rated Voltage – See Item 29B.)

For reduced voltage operation the motor must be designed for the pull out torque shown in the following table and priced from item 33A.

Percent of Rated Voltage		Percent Pull Out Torque
Momentary (60 Seconds or Less)	Continuous Under Emergency Conditions	Required for Reduced-Voltage Operation at Rated Full-Load Torque
70	90	Standard Motor
65	85	250
60	80	300
55	75	350
50	70	400

C. Starting Torque

Standard starting torques shown in the following table will be supplied without price addition.

Horsepower	Starting Torque in Percent of Full-Load Value			
	2-Pole	4-Pole	6-Pole	8-Pole
200	. . .	. . .	. . .	120
250	. . .	. . .	. . .	100
300-350	. . .	80	100	60
400-500	70	80	60	60
600 and Larger	60	60	60	60
	10-Pole	12-Pole	14-Pole	16-Pole
100	120	115	110	105
125-150	115	115	110	105
200	115	115	110	105
250	60	60	60	60
300-350	60	60	60	60
400-500	60	60	60	60
600 and Larger	60	60	60	60

For motors specified with starting torques higher than those listed in the above table add percentages as follows:

Starting Torque	Percentage List Price Addition
Above 60% to 90%	4%
Above 90% to 125%	8%
Above 125% to 150%	15%
Above 150% to 200%	20%
Above 200%	Refer to Westinghouse

Item 34. Tropical Protection

Tropical protection may involve special insulation, screens on all openings, and/or protection against fungus. Make price additions as required for the following:

Special insulation . . . . . see Item 17
Screens . . . . . see Item 8B

Fungus protection:
Squirrel-cage motors . . . **add 5 percent**②
Wound-rotor motors . . . **add 7.5 percent**③

② No addition is required for motors with Thermalastic® Epoxy insulation.
③ For motors with Thermalastic Epoxy insulation on stator, **add 2.5 percent.**

The "fungus protection" involves special treatment of insulation against fungus.

Item 35. Voltages

A – Standard Voltages

Standard voltages for each rating are as shown in the tabulation of basic prices in Price List 3120 P WE A.

Motors will operate successfully, but not necessarily in accordance with the standard guarantees, at a voltage 10 per cent above or below the nameplate rating.

B – Other Voltages

For other voltages for all horsepower ratings, price addition must be made as listed in Tables a and b.

Note: For 2300/4000 volt or 2400/4160 volts, add for 4000 volts only.

Table a: Voltages Below 601 Volts

Horsepower Rating	330② to 600 Volts			
	440, 460, 550 or 575 Volts		Other Than 440, 460, 550 or 575 Volts in This Range	
	Modification Symbol			
	D, E	G-I	D, E	G-I
	Percentage List Price Addition to 460 Volt Motor List Price			
100-500	0	0	5%	5%
	Percentage List Price Addition to 2300 Volt Motor List Price			
501-800	10%	7½%	15%	12½%
801-2500	Refer to Westinghouse		Refer to Westinghouse	

② For voltages below 330 volt, refer to Westinghouse.

Table b: Voltages 601 Through 6900 Volts

Horsepower Rating	601 to 2500 Volts		2501 to 4160 Volts							
	2300 Volts	Other Than 2300 Volts in This Range	4000 or 4160 Volts				Other Than 4000 or 4160 Volts in This Range			
	Modification Symbol									
	D-I	D-I	D	E	G	I	D	E	G	I
	Percentage List Price Addition to 2300 Volt Motor List Price									
100-125	0	5%	Not Available →				Not Available →			
126-249	0	5%	③	③	③	③	③	③	③	③
250-2500	0	5%	15%	12½%	10%	7½%	20%	17½%	15%	12½%

Horsepower Rating	4161 to 5000 Volts				5001 to 6900 Volts					
	All Voltages Within This Range				6600 or 6900 Volts			Other Than 6600 or 6900 Volts in This Range		
	Modification Symbol									
	D	E	G	I	D, E	G	I	D, E	G	I
	Percentage List Price Addition to 2300 Volt Motor List Price									
100-125	Not Available →				Not Available →			Not Available →		
126-249	③	③	③	③	Not Available →			Not Available →		
250-349	20%	17½%	15%	12½%	Not Available →			Not Available →		
350-500	20%	17½%	15%	12½%	④	④	④	④	④	④
501-2500	20%	17½%	15%	12½%	60%	40%	35%	65%	45%	40%

③ Price as 250 hp motor at same speed and voltage as required motor.

④ Price as 600 hp motor at same speed and voltage as required motor.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Accessories

Item 41. Air Filters

A. Air Filter Holders

Provision for air filter holders is standard when specified only on WP II enclosure. Open dripproof and weather protected Type I motor enclosures must be modified for filter holders when filters are specified. Add from Table A (ODP and WP-I) or Table B (WP-II).

List price addition for provision for filters (filter holders) does not include the filters.

Table A – Dripproof and WP-I Enclosures
(Reusable-type② Air Filter Holders)

Number of Poles	Modification Symbol D-G	Modification Symbol I
	List Price Addition②	
2, 4	$2000	$ 350
6 or more	2000	2000

② For holders for disposable type filters, increase list price additions by $1000.

Table B – WP-II Enclosure

Filter Holder	List Price Addition
Reusable Type	No Charge
Disposable Type	$1000

B. Air Filters

Standard filters are removable, washable, impingement type. Standard filter construction is galvanized steel media and galvanized steel frame.

When air filters are required, it is recommended that one of the stator winding temperature detecting devices, Item 49, or air pressure differential switch (manometer), Item 42, be considered.

For air filters on dripproof③, WP-I③, or WP-II④ motors, add from Table C.

Table C – Filters

Filter Media	Modification Symbol③ D, E	Modification Symbol③ G-I
	List Price Addition	
Galvanized Steel (Standard)	$250	1% but not less than $250
Aluminum	250	1% but not less than $250
Copper	350	2% but not less than $350
Stainless Steel	750	3% but not less than $750
Disposable Type●	250	1% but not less than $250

③ Dripproof and WP-I motors also require addition for air filter holders from Table A

● WP-II enclosure also requires addition for air filter holders from Table B when disposable type filters are specified

Item 42. Air Pressure Differential Switch (Manometer)

For air pressure switch to alarm on differential pressure in motor ventilating system of motor having filters **add $250 list.**

For provision for mounting switch in field **add $100 list.** (Complete details for mounting must accompany order)

Item 43. Bearing Temperature Detectors

A. Bearing Temperature Relay, **add $250 list** each relay.

B. Bearing Temperature Detectors, Resistance type detector (RTD):
10 OHM or 120 OHM, **add $250 list** each RTD.
100 OHM (platinum), **add $500 list** each RTD.

C. Bearing Temperature Detectors, Thermocouple Type, either copper constantan or iron constantan, **add $250 list each** thermocouple.

D. Bearing Temperature Detectors, Dial Type Thermometer, **add $250 list** each thermometer.

E. Where drilling only for bearing temperature detector is specified (detector furnished by others) **add $50 list** per bearing.

Note: Prices in B and C above do not include temperature indicating equipment. For prices of monitoring equipment, refer to Instrument Division.

Item 44. Couplings – Press on Half-Coupling

For pressing on either rigid or flexible half-couplings make additions from table at right.

	Modification Symbol D, E	Modification Symbol G, I
	List Price Addition	
Flexible Half-Coupling	$353	$ 412
Rigid Half-Coupling	941	1000

Rigid couplings are to be shipped to our works rough bored. We will finish bore and key-seat them. Flexible couplings are to be shipped to our works finish bored and key-seated to our dimensions. If we are to finish bore and key-seat flexible couplings, use same price addition as for rigid couplings.

Item 45. Grounding Lugs, Non-Standard
When purchaser specifies machine grounding pads or lugs other than Westinghouse standard, **add $200 list.**

Item 46. Soleplates
Soleplates are machined spacers fitted between the motor feet and the motor base. For soleplates, add per table at right.

Modification Symbol	D, E	G-I
	Percentage List Price Addition	
Soleplates, 2 pieces	3%	2%
Soleplates, 1 piece	6%	4%

Note: For horizontal jacking bolts, make further addition of **1%.**

Item 47. Space Heaters
Space heaters are low watt density, wrap around type, laced on the end turns of the stator winding. Low watt density assures long life at full voltage operation.

If space heaters are required add as follows:

Standard Heaters	Modification Symbol D, E	G-I
List Price Adder	**$85**	**$110**

Where special low surface temperature heaters are required list price additions are to be made as follows:

Maximum Sheath Temperature	Modification Symbol D, E	G-I
144°C	**$250**	**$350**

Item 48. Speed Sensing Switch
For anti-plugging switch, zero speed switch, or overspeed device mounted on the motor **add $500 list.**

Note: For speed sensing switch on T.E.F.C. or Explosion Proof motors, refer to Westinghouse.

Item 49. Stator Winding Temperature Detectors
Stator winding temperature detectors are furnished six per set (two per phase). List price additions are as follows:

A. Resistance Type (RTD's)
10 Ohm or 120 Ohm:
Up to 1500 Hp, **add $600 list per set**
Above 1500 Hp, **no charge**

100 Ohm (Platinum):
Up to 1500 Hp, **add $1200 list per set**
Above 1500 Hp, **add $600 list per set**

B. Thermocouples, Either Copper Constantan or Iron Constantan
Up to 1500 Hp, **add $600 list per set**
Above 1500 Hp, **no charge**

Note: Prices above do not include temperature indicating equipment. For prices of monitoring equipment, refer to Instrument Division, Newark, New Jersey.

Item 50. Stator Winding Thermal Protection

A. Guardistor® Thermal Protection
Guardistor solid state motor protection utilized PTC thermistors on the end turns of the motor winding and a solid state, encapsulated control relay. The control relay is wired into the motor starter holding coil circuit and opens it on excessive motor temperature. The low mass of the thermistors permits fast thermal response and therefore protection against the following abnormal conditions:

Overload, High ambient, Abnormal voltage, Ventilation failure, and Single phase condition.

The relay operates a control circuit voltage of 115/230 Volts, 60 cycle or 110/220 Volts, 50 Cycle. On applications at other control voltages, refer to Westinghouse.

Note: Size 5 Contractor and larger on 115 volts and contactors larger than size 5 on 230 volts require an interposing relay rated 30 VA.

Add $200 list for single set of thermistors and **$275 list** for two sets of thermistors.

B. Thermoguard® Protection
For three bi-metallic thermal sensing devices on the end turns of the motor winding to protect against overheating of the winding due to overloads, **add $200 list** per set.

Note: Order must specify either normally open or normally closed.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

Printed in U.S.A.

July 20, 1976
New Information
Prices effective July 20, 1976 and subject to change without notice.
(Refer to Selling Policy 3000 S WE A)
Mailed to: E, D, C/1738/PL

Squirrel Cage, Wound Rotor
Frames 5006-6811
Discounts: Same as the motor being modified.

Industrial Large Induction Horizontal Motor Accessories

Item 51. Main Terminal (Conduit) Box
The standard terminal box has ample room for three main leads including stress cones and has construction comparable with the degree of enclosure for the motor itself.

A large box is required when more than 3 main leads or additional accessories mounted in the conduit box are specified.

List price addition for the special main terminal box must be made as well as list price additions for any accessories. (Make list price addition for Special Terminal box only once per motor.)

For special oversize conduit box, add as follows:

Modification Symbol		
D	E	G-I
$250	**$350**	**$450**

Item 52. Current Transformers
A. For three differential protection window type current transformers mounted in main conduit box with main and neutral leads of each phase passing through their own CT, **add $1200 list.**

B. For bar or window type current transformer mounted in main conduit box, including coordination with control manufacturer (when required), **add $450 list** for each transformer.

C. For mounting only of customer supplied current transformer in main conduit box, **add $250 list** for each transformer.

Note: Prices in A, B and C above do not include special oversize conduit box. Refer to Item 51 for list price of special conduit box.

Item 53. Lead Terminators
Standard lead terminator is AMP compression type terminal with holes for bolting to customers terminals on incoming cable. For non-standard terminals, **add $200 list.**

If terminals are required for incoming cables, **add $300 list.**

Item 54. Quick Disconnect Terminals
For supplying a set of three quick disconnect terminals, similar to the Elastimold type, **add $1000 list.**

Item 55. Surge Protection

For surge capacitor or lightning arrestors add from table at right.

Prices for surge capacitors and lightning arrestors do not include necessary special conduit box. Refer to Item 51 for special terminal box.

Note: Lightning arrestors are not available on motor without surge capacitor.

Motor Voltage	Surge Capacitors		Lightning Arresters	
	Rating in Max. Volts	**List Price Addition**	Rating in Max. Volts	**List Price Addition**
2300	2400	**$2000**	3000	**$1500**
4000	4160	**2500**	4500	**2000**
4600	4800	**3000**	6000	**2500**
6600	6900	**3500**	7500	**3000**

Note: Surge capacitors can not be mounted on the following Buffalo Life-Line D motors: 5000 frames, any enclosure; and 5800 and 6800 frame, totally enclosed fan cooled enclosure. When required on these frames, suggest floor mounted Surge-Pak from Bloomington.

Item 56. Vibration Switch

A vibration switch protects the motor from extensive damage from mechanical malfunction (impending bearing failure, coupled pump, fan or compressor-motor system vibration etc.). When the vibration level of a machine exceeds normal by a preselected amount, an internal switch closes, actuating a shut-down circuit before costly damage occurs.

The price additions shown below apply to a device as selected by Westinghouse and mounted on the motors.

Type	**List Price Addition Per Switch**
Non-explosion proof	**$400**
Explosion-proof	**800**

Note: The preceding list prices include both manual and electric reset with 115 volt dc holding coil; control is not included but control can be furnished when specified for an **addition of $750 list.** Refer to the factory when a specific type vibration switch is required.

Item 57. Vibration Probes

For vibration probes similar to Bentley-Nevada type, **add $750 list** per probe, if mounted by Westinghouse. For proximitor with housing, **add $1000 list** per proximitor. Note that there are usually two probes and proximitors required per bearing.

For drilling only for vibration probes, **add $200 list** per probe.

For a single motor readout (2 points of vibration – both single plane,) **add $5500 list.** For a single motor readout as above, but with rotor position, **add $8500 list.**

Item 58. Identification Plates

Where purchaser requires Westinghouse to furnish and/or mount special identification plates on the motor, **add $50 list** for each plate.

Item 59. Microfilm Aperture Cards

Where motor drawings are required to be furnished as microfilm aperture cards, **add $200 list** per requisition item.

Westinghouse Electric Corporation
Large Motor Division
Buffalo, New York, U.S.A. 14240

Prices effective July 20, 1976 and subject to change without notice.
Discounts: Same as the motor being modified.

Printed in U.S.A.