

SIEMENS

Series 81000
Medium Voltage Controllers
Pricing Guide



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The Siemens 81000 medium voltage controller provides the design flexibility to meet today's demanding electrical equip-

ment needs. The generous front cable access and drawout controller design provides for easy installation, simple

maintenance and a high degree of personnel safety that are essential for today's modern electrical installations.

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Standards

National Standards

Siemens 81000 controllers meet or exceed all applicable requirements as set forth under NEMA ICS-2 "STANDARDS FOR INDUSTRIAL CONTROL DEVICES, CONTROLLERS AND ASSEMBLIES", NFPA 70 (NEC) ARTICLE 710, AND UL 347.

Industry Standards

Siemens 81000 controllers also meet or exceed the requirements set forth under the AMERICAN PETROLEUM INSTITUTE standard 543.

Ratings

Table 1: Siemens 81000 Class E Controller Ratings per NEMA ICS 2-324

81000 Contactor Ratings									
Contactor Type	System Voltage	Enclosed Continuous Ampere Rating	Interrupting Capacity		Horsepower Rating (3 Phase)			Transformer Loads	
					Synchronous Motors		Induction Motors	Maximum 3-Phase KVA	Maximum Fuse Rating
			Unfused Class E1	Fused Class E2	0.8 PF	1.0 PF			
90H35	2300	360	5kA	200MVA	1500	1750	1500	1500	450E
90H6	2300	720	10kA	200MVA	3000	3500	3000	2000	600E
90H35	4000	360	5kA	350MVA	2500	3000	2500	2500	450E
90H6	4000	720	10kA	350MVA	5000	5500	5000	3500	600E
90H35	4600	360	5kA	400MVA	2500	3000	2500	2500	450E
90 6	4600	720	10kA	400MVA	5500	6000	5500	4000	600E
90H37	7200 ⁽¹⁾	360 ⁽³⁾	5kA	570MVA	3500	4500	3500	1500 ⁽²⁾	200E

(1) Nominal Voltage 6600V

(2) @ 6900V

(3) 360A Unfused, 310A Fused (maximum fuse size available)

Enclosures

Table 2: Siemens 81000 Motor Controller Enclosures

NEMA Type	Description
1	General purpose indoor
1	General purpose indoor gasketed
2	Indoor drip proof
3R	Outdoor non-walk in or walk in
12	Indoor dusttight & driptight

Instructions for Pricing

Step 1

Determine the number of vertical sections that will be required. Please refer to page 4. These examples do not include all the possible variations of the product. For more information consult the Application Guide or Factory.

Step 2

Select the **Controller** prices from the price list, Tables 3-11.

Step 3

Select the **Load Interrupter Switches** from the price list, Table 12.

Step 4

Select the **Enclosure** modifications from the price list, Table 13.

Step 5

Select the **Main Bus** modifications from the price list, Table 14.

The preceding five steps must always be completed. The following steps will be made depending on the specific requirements of each job.

Step 6

Select special **Terminations**, Table 15.

Step 7

Select **Instrument & Control Power Transformers**, Table 16.

Step 8

Select **Surge Protection Equipment**, Table 17.

Step 9

Select **Power Factor Correction Capacitors**, Table 18.

Step 10

Select **Contactor Options**, Table 19.

Step 11

Select **Protective Relays**, Table 20.

Step 12

Select **Instruments & Meters**, Table 21.

Step 13

Select **Switches & Lights**, Table 22.

Step 14

Select **Control Circuit Devices**, Table 23.

Step 15

Select **Cubicle Modifications**, Table 24.

Step 16

Select **Spare Parts & Accessories**, Table 25.

Typical Layouts for Series 81000

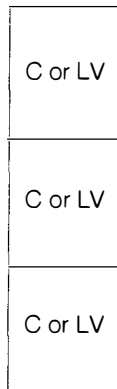


Fig A

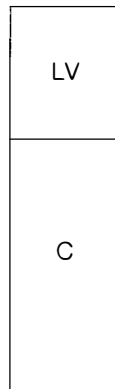


Fig B

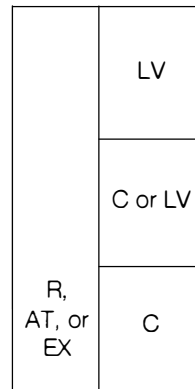


Fig C

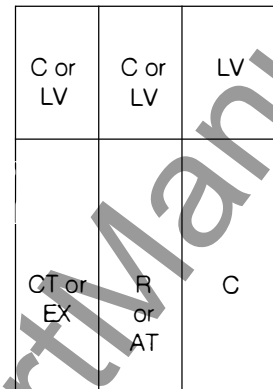


Fig D

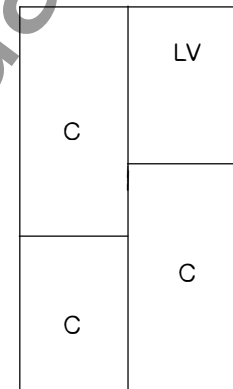


Fig E

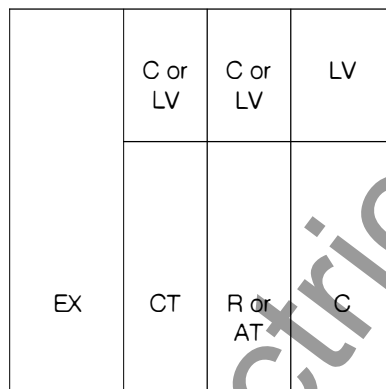


Fig F

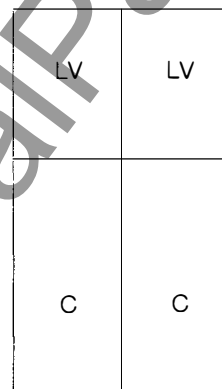


Fig G

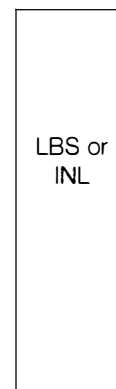


Fig H

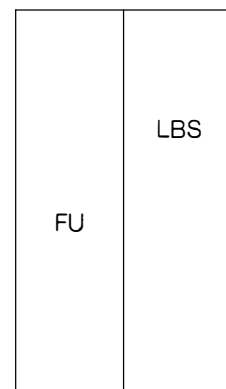


Fig I

Key:

- AT - Auto-transformer
- C - Medium Voltage Contactor
- CT - Cable Terminations
- EX - Space for Field Excitation Equipment
- FU - Fuses
- INL - Incoming Line
- LBS - Load Break Switch
- LV - Low Voltage (Control)
- R - Reactor

Notes:

1. When upper cell is used for a drawout contactor, horizontal main bus (if required) is mounted on top of unit. This adds 10" to height of indoor structure.
2. Weights and dimensions for auto-transformer and reactor controllers vary as motor size varies.
3. For static exciter with any brush-type synchronous controller, using Series 85000 Synchronizing and Protection Module, add one 24" wide auxiliary structure.
4. Metering and protective device space requirements may warrant addition of a 24" wide auxiliary structure.
5. Power Factor Correction capacitors, when required with a FVNR controller, take

the same space as an additional controller (1/3 of a vertical structure).

6. Surge Protection, consisting of 3-phase station class surge arrestors and surge capacitors, requires a 24" wide auxiliary section.
7. Type 3EF1 surge limiters can be provided with any controller with no effect on layout or dimensions.
8. Special metering and relaying can be provided. A wide variety of current and voltage sensing relays, metering devices, ACCESS™ system components, and similar equipment is available. Normally, the top 1/3 of the structure will be devoted to a low voltage section, and the middle and lower cells will each house a FVNR starter.

Typical Layouts for Series 81000

Type of Controller	Controller Rating	Number of Contactors	Approx. Shipping Weight (lbs) With Contactors		Approximate Installation Dimensions (inches)					Layout Arrangement Figure
			NEMA 1 or 12 Enclosure	NEMA 3R Enclosure	NEMA 1, 1A or 12 Enclosure			NEMA 3R Enclosure		
					Height	Width	Depth	Walk-in Width	Non-Walk-in Width	
Induction Full Voltage Non-Reversing	5kV 360A 5kV 720A 7kV 310A	1 1 1	1400 1600 1500	1600 1800 1700	30 90 90	36 36 36	36 36 36	42 42 42	42 42 42	A B B
Induction Reduced Voltage-Reactor Non-Reversing	5kV 360A 5kV 720A 7kV 310A	2 2 2	4000/6800 7400/8800 4600/7400	4400/7200 7800/9200 5000/7800	90 90 90	60/72 96/108 96/108	36 36 36	78 114 114	78 120 120	C D D
Induction Reduced Voltage-Autotransformer Non-Reversing	5kV 360A 5kV 720A 7kV 310A	3 3 3	4200/7000 7600/9000 4800/7600	4600/7400 8200/9600 5400/8200	90 90 90	60/72 96/108 96/108	36 36 36	78 114 114	78 120 120	C D D
Induction Full Voltage Reversing	5kV 360A 5kV 720A 7kV 310A	3 3 3	1800 3200 2000	2000 3600 2200	90 90 90	36 72 36	36 36 36	42 78 42	42 78 42	A E B
Synchronous Full Voltage Non-Reversing	5kV 360A 5kV 720A 7kV 310A	1 1 1	2000 2200 2100	2400 2600 2500	90 90 90	60/72 72/84 72/84	36 36 36	78 78/114 78/114	78 78/120 78/120	C C C
Synchronous Reduced Voltage-Autotransformer Non-Reversing	5kV 360A 5kV 720A 7kV 310A	3 3 3	5100/7900 8500/9900 5700/8500	5700/8500 9300/10700 6500/9300	90 90 90	84/108 132/144 132/144	36 36 36	114 150 150	120 156 156	D F F
Induction Full Voltage 2-Speed, 2-Winding	5kV 360A 5kV 720A 7kV 310A	2 2 2	1800 3200 3000	2000 3600 3400	90 90 90	36 72 72	36 36 36	42 78 78	42 78 78	A G G
Induction Full Voltage 2-Speed, 1-Winding	5kV 360A 5kV 720A 7kV 310A	3 3 3	2000 Note 1 3300	2200 Note 1 3700	90 Note 1 90	36 Note 1 72	36 Note 1 36	42 Note 1 78	42 Note 1 78	A Note 1 G
Latched Contactor	5kV 360A 5kV 720A 7kV 310A	1 1 1	1400 1600 1500	1600 1800 1700	90 90 90	36 36 36	36 36 36	42 42 42	42 42 42	A B B
LBS-unfused 600A or 1200A LBS-600A fused (to 450E)	5kV 7kV	— —	1400 1400	1600 1600	90 90	36 36	36 36	42 42	42 42	H H
LBS-1200A fused (to 1100E)	5kV 7kV	— —	2200 2200	2600 2600	90 90	72 72	36 36	78 78	78 78	I I
Incoming Line Main Lugs Only	5kV 7kV	— —	600 600	800 800	90 90	18/24/36 18/24/36	36 36	42 42	42 42	H H

Note 1: Consult Factory

All dimensions and weights are for estimating purposes only—not for construction!

NEMA 3R Walk-in Enclosures are 107" H x 101" D

NEMA 3R Non Walk-in Enclosures are 100" H x 47" D

Rough approximation for weights

1200# per vertical structure, indoor

600# per horizontal structure, indoor

1200 - 4100# per vertical structure, 360A

1400 - 4300# per vertical structure, up to 360A

add 200# per contactor, 5kV 360A

add 400# per contactor, 5kV 720A

add 300# per contactor, 7kV 310A

add 200# per structure, outdoor

Controllers

Table 3: Full Voltage Non-Reversing Induction Motor Controller

2200 to 2400 Volt			4000 to 4800 Volt			7200 Volts		
Max HP	Price	Contactor Type	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type
250	\$10,400	90H35	450	\$10,400	90H35	800	\$13,400	90H37
700	\$11,600	360A	1250	\$11,600	360A	2000	\$14,600	310A
1500	\$12,800		2500	\$12,800		3500	\$15,800	
2250	\$17,600	90H6	3500	\$17,600	90H6			
2500	\$18,800	720A	5000	\$18,800	720A			

Price includes the following standard controller components:

- 1 - 3 Pole Vacuum Contactor
- 3 - Primary Current Limiting Fuses
- 1 - 3/4 KVA Control Power Transformer with primary current limiting fuses
- 1 - Master Control Relay with 3 N.O. & 1 N.C. contacts
- 1 - Start/Stop Pushbutton
- 1 - 3 Phase Ambient Compensated Thermal Overload Relay
- 1 - Externally mounted Overload Reset Button
- 3 - Current Transformers
- 1 - Test Switch & Circuit
- 1 - Contactor Position Indicating Light
- 1 - Contactor Carriage Racking Mechanism (for 90H35 and 90H37)
- 1 - Fuse Carriage Racking Mechanism (for 90H6)

Controllers

Table 4: Reduced Voltage Primary Reactor Non-Reversing Induction Motor Controller

2200 to 2400 Volt			4000 to 4800 Volt			7200 Volts		
Max HP	Price	Contactor Type	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type
100	\$18,600	90H35 360A	100	\$19,000	90H35 360A	1000	\$28,880	90H37 310A
200	\$19,400		200	\$20,000		1500	\$31,760	
400	\$20,000		400	\$21,000		2000	\$33,340	
600	\$21,600		600	\$21,600		3000	\$34,200	
700	\$23,000		700	\$23,000		4000	\$35,080	
800	\$23,400		800	\$23,400				
1000	\$24,800		1000	\$24,800				
1250	\$26,000		1250	\$26,000				
1500	\$29,800		1500	\$29,800				
1750	\$33,260	90H6 720A	1750	\$30,800	90H6 720A			
2000	\$34,700		2000	\$31,800				
2250	\$35,940		2250	\$33,000				
2500	\$36,760		2500	\$34,000				
			3000	\$42,320				
			3500	\$44,580	90H6 720A			
			4000	\$47,060				
			4500	\$49,620				

* Prices shown are for 60Hz application. Add 10 percent to the list price for 50Hz applications.

Price includes the following standard controller components:

- 1 - 3 Pole Main Vacuum Contactor
- 1 - 3 Pole Shorting Vacuum Contactor
- 3 - Primary Current Limiting Fuses
- 1 - Primary Reactor with 50, 65 & 80% voltage taps
- 1 - Automatic Transfer Timing Relay
- 1 - Incomplete Sequence Relay
- 1 - 3/4kVA Control Power Transformer with primary current limiting fuses
- 1 - Master Control Relay with 3 N.O. & 1 N.C. contacts
- 1 - Start/Stop Pushbutton
- 1 - 3 Phase Ambient Compensated Thermal Overload Relay
- 1 - Externally Mounted Overload Reset Button
- 3 - Current Transformers
- 1 - Test Switch & Circuit
- 1 - Contactor Position Indicating Light
- 1 - Contactor Carriage Racking Mechanism (for 90H35 and 90H37)
- 1 - Fuse Carriage Racking Mechanism (for 90H6)

Controllers

Table 5: Reduced Voltage Auto-Transformer Non-Reversing Induction Motor Controller

2200 to 2400 Volt			4000 to 4800 Volt			7200 Volts		
Max HP	Price	Contactor Type	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type
100	\$21,268	90H35 360A	100	\$22,080	90H35 360A	1000	\$33,920	90H37 310A
200	\$22,480		200	\$23,080		1500	\$36,800	
400	\$23,080		400	\$24,080		2000	\$38,380	
600	\$24,680		600	\$24,680		3000	\$39,240	
700	\$26,080		700	\$26,080		4000	\$40,120	
800	\$26,480		800	\$26,480				
1000	\$27,880		1000	\$27,880				
1250	\$29,080		1250	\$29,080				
1500	\$32,880	90H6 720A	1500	\$32,880	90H6 720A			
1750	\$38,200		1750	\$33,880				
2000	\$39,640		2000	\$34,880				
2250	\$40,880		2250	\$36,080				
2500	\$41,720		2500	\$37,080				
			3000	\$47,260				
			3500	\$49,540				
			4000	\$52,000				
			4500	\$54,260				

* Prices shown are for 60Hz application. Add 10 percent to the list price for 50Hz applications.

Price includes the following standard controller components:

- 1 - 3 Pole Main Vacuum Contactor
- 1 - 2 Pole Starting Vacuum Contactor
- 1 - 2 Pole Running Vacuum Contactor
- 3 - Primary Current Limiting Fuses
- 1 - Auto-transformer with 50, 65 & 80% voltage taps
- 1 - Automatic Transfer Timing Relay
- 1 - Incomplete Sequence Relay
- 1 - 3/4kVA Control Power Transformer with primary current limiting fuses
- 1 - Master Control Relay with 3 N.O. & 1 N.C. contacts
- 1 - Start/Stop Pushbutton
- 1 - 3 Phase Ambient Compensated Thermal Overload Relay
- 1 - Externally mounted Overload Reset Button
- 3 - Current Transformers
- 1 - Test Switch & Circuit
- 1 - Contactor Position Indicating Light
- 1 - Contactor Carriage Racking Mechanism (for 90H35 and 90H37)
- 1 - Fuse Carriage Racking Mechanism (for 90H6)

Controllers

Table 6: Non-Reversing Brushless Synchronous Motor Controller Adder

Select the appropriate adder from the table below based on the motor horsepower. Add this figure to the Full Voltage (Table 3), Reduced Voltage Primary Reactor (Table 4) or Reduced Voltage Auto-Transformer Non-Reversing Induction Motor Controller (Table 5) price to obtain the total controller price.

Max HP	Adder
500	\$4760
1500	\$5880
3500	\$7700
5000	\$9600

The following components will be added to the controller:

- 1 - DC Power Supply
- 1 - Variac for Exciter-Field adjustment
- 1 - Pull out Relay (device 55)
- 1 - Timer to apply DC Power to the Exciter
- 1 - DC Ammeter
- 1 - Incomplete Sequence Relay

Table 7: Non-Reversing Brush Type Synchronous Motor Controller Adder

Select the appropriate adder from the table below based on the motor field requirements. Add this figure to the Full Voltage (Table 3), Reduced Voltage Primary Reactor (Table 4) or Reduced Voltage Auto-Transformer Non-Reversing Induction Motor Controller (Table 5) price to obtain the total controller price.

The following components will be added to the controller:

85000 Solid State Synchronizing and Protection System

- 1 - Control and Protection Module
- 1 - Power Module
- 1 - Potential Transformer
- 1 - Excitation Transformer
- 1 - Field Discharge Resistor
- 1 - DC Shunt Ammeter

Add \$1200 if an Automatic Power Factor controller module is desired.

DC Field Current	125VDC Field	250VDC Field
0.0 - 8.3A	\$12,770	\$12,770
8.4 - 12.5A	\$12,770	\$13,135
12.6 - 16.6A	\$12,770	\$13,610
16.7 - 25.0A	\$13,135	\$14,110
25.1 - 33.3A	\$13,610	\$14,390
33.4 - 41.6A	\$14,110	\$14,840
41.7 - 50.0A	\$14,390	\$15,650
50.1 - 66.7A	\$14,840	\$16,216
66.8 - 83.3A	\$15,650	\$17,740
83.4 - 100.0A	\$16,216	\$18,040
100.1 - 125.0A	\$17,740	\$18,620
125.1 - 166.7A	\$18,040	\$19,485
166.8 - 250.0A	\$18,620	\$21,805
250.1 - 333.2A	\$19,485	\$24,125
333.3 - 400.0A	\$21,805	\$26,445

Controllers

Table 8: Full Voltage Non-Reversing Two Speed Two Winding Induction Motor Controller

2200 to 2400 Volt			4000 to 4800 Volt			7200 Volts		
Max HP	Price	Contactor Type	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type
250 700 1500	\$17,010 \$18,210 \$19,410	90H35 360A	450 1250 2500	\$17,010 \$18,210 \$19,410	90H35 360A	800 2000 3500	\$22,750 \$23,950 \$25,150	90H37 310A
2250 2500	\$27,375 \$28,575	90H6 720A	3500 5000	\$27,375 \$28,575	90H6 720A			

Price includes the following standard controllers components:

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> 1 - 3 Pole "High Speed" Vacuum Contactor 1 - 3 Pole "Low Speed" Vacuum Contactor 6 - Primary Current Limiting Fuses 2 - 3/4kVA Control Power Transformer with primary current limiting fuses | <ul style="list-style-type: none"> 2 - Master Control Relay with 3 N.O. & 1 N.C. contacts 2 - Start/Stop Pushbutton 2 - 3 Phase Ambient Compensated Thermal Overload Relay 2 - Externally mounted Overload Reset Button | <ul style="list-style-type: none"> 6 - Current Transformers 2 - Test Switch & Circuit 2 - Contactor Position Indicating Light 2 - Contactor Carriage Racking Mechanism (for 90H35 and 90H37) 2 - Fuse Carriage Racking Mechanism (for 90H6) |
|---|---|--|

Table 9: Full Voltage Non-Reversing Two Speed One Winding Induction Motor Controller

2200 to 2400 Volt			4000 to 4800 Volt			7200 Volts		
Max HP	Price	Contactor Type	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type
250 700 1500	\$23,610 \$24,810 \$26,010	90H35 360A	450 1250 2500	\$23,610 \$24,810 \$26,010	90H35 360A	800 2000 3500	\$31,525 \$32,725 \$33,925	90H37 310A
2250 2500	\$38,750 \$39,950	90H6 720A	3500 5000	\$38,750 \$39,950	90H6 720A			

Price includes the following standard controller components:

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> 1 - 3 Pole "High Speed" Vacuum Contactor 1 - 3 Pole "Low Speed" Vacuum Contactor 1 - 2 Pole Shorting Contactor 6 - Primary Current Limiting Fuses 2 - 3/4kVA Control Power Transformer with primary current limiting fuses | <ul style="list-style-type: none"> 2 - Master Control Relay with 3 N.O. & 1 N.C. contacts 2 - Start/Stop Pushbutton 2 - 3 Phase Ambient Compensated Thermal Overload Relay 2 - Externally mounted Overload Reset Button 6 - Current Transformers | <ul style="list-style-type: none"> 2 - Test Switch & Circuit 2 - Contactor Position Indicating Light 2 - Contactor Carriage Racking Mechanism (for 90H35 and 90H37) 2 - Fuse Carriage Racking Mechanism (for 90H6) |
|--|---|--|

Controllers

Table 10: Full Voltage Non-Reversing Wound Rotor Induction Motor Controller

Accel Points	2200 to 2400 Volt ⁽¹⁾⁽²⁾			4000 to 4800 Volt ⁽¹⁾⁽²⁾			7200 Volts ⁽¹⁾⁽²⁾		
	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type
4	150	\$17,520	90H35 360A	150	\$17,520	90H35 360A	150	\$17,520	90H37 310A
5	200	\$21,120		200	\$21,120		200	\$21,120	
5	300	\$25,200		300	\$23,760		300	\$23,760	
6	400	\$27,120		400	\$25,680		400	\$25,680	
6	600	\$30,720		600	\$29,280		600	\$29,280	
7	700	\$33,360		700	\$31,920		700	\$31,920	
7	1000	\$35,520		1000	\$34,080		1000	\$34,080	
7	1250	\$41,760		1250	\$40,320		1250	\$40,320	
7	1500	\$48,480	90H6 720A	1500	\$47,040	90H6 720A	1500	\$47,040	
7				1750	\$52,320		1750	\$52,320	
7	1750	\$56,960		2000	\$55,920		2000	\$55,920	
7	2000	\$60,660		2250	\$59,040		2250	\$59,040	
7	2250	\$63,880		2500	\$63,600		2500	\$63,600	
7	2500	\$69,560					3000	\$78,960	
7				3000	\$78,960	90H6 720A	3500	\$87,840	
7				3500	\$87,840				
7				4000	\$105,740				
7				4500	\$114,600				

⁽¹⁾ Prices are based on a maximum secondary voltage of 600V.

⁽²⁾ Prices are based on Starting Duty only - consult factory for Speed Regulating Duty.

**Price includes the following
standard controller components:**

- 1 - 3 Pole Vacuum Contactor
- 3 - Primary Current Limiting Fuses
- 1 - 3/4kVA Control Power Transformer with primary current limiting fuses
- 1 - Master Control Relay with 3 N.O. & 1 N.C. contacts
- 1 - Start/Stop Pushbutton
- 1 - 3 Phase Ambient Compensated Thermal Overload Relay
- 1 - Externally mounted Overload Reset Button
- 3 - Current Transformers
- 1 - Test Switch & Circuit
- 1 - Contactor Position Indicating Light
- 1 - Contactor Carriage Racking Mechanism (for 90H35 and 90H37)
- 1 - Fuse Carriage Racking Mechanism (for 90H6)

- X - Three Phase Low Voltage Starting Resistor
- X - Two Pole Low Voltage Shorting Contactor
- X - Timing Relay

X = Accelerating Points - 1

Controllers

Table 11: Reversing Motor Controller Adder

Select the appropriate adder from the table below based on the motor horsepower and voltage. Add this figure to

any non-reversing controller price (Tables 3-10) to obtain the total controller price.

2200 to 2400 Volt			4000 to 4800 Volt			7200 Volts		
Max HP	Price	Contactor Type	Max HP	Price	Contactor Type	Max HP	Price	Contactor Type
250	\$6580	90H35	450	\$6580	90H35	800	\$8180	90H37
700	\$6580	360A	1250	\$6580	360A	2000	\$8180	310A
1500	\$6580		2500	\$6580		3500	\$8180	
2250	\$9775	90H6	3500	\$9775	90H6			
2500	\$9775	720A	5000	\$9775	720A			

The following components will be added to the controller:

- 1 - 2 Pole Forward Vacuum Contactor
- 1 - 2 Pole Reversing Vacuum Contactor

Note - A drawout 360A contactor may be furnished upon request for 2400V controllers below 1500Hp and for 4160V controllers below 2500Hp.

Load Interrupter Switches

Table 12: Load Interrupter Switches

Fuse Sizes	400A Switch ⁽¹⁾	600A Switch ⁽²⁾	1200A Switch
None	\$5470	\$6820	\$9520 ⁽²⁾
150E Max	\$7520	\$8870	\$13,530 ⁽²⁾
250E Max	\$8440	\$9790	\$14,650 ⁽²⁾
450E Max	\$9450 ⁽⁴⁾	\$10,800	\$15,660 ⁽²⁾
600E Max	N/A	\$15,040	\$19,900 ⁽³⁾
1100E Max	N/A	N/A	\$24,080 ⁽³⁾

⁽¹⁾ Occupies one 30" high compartment.

⁽²⁾ Occupies one complete vertical section.

⁽³⁾ Occupies two complete vertical sections.

⁽⁴⁾ 350E maximum fuse available.

Enclosure Modifications

Table 13: Enclosures - Add Per Vertical Section

Indoor NEMA 1	STD
Indoor gasketed NEMA 1	\$360
Indoor drip proof NEMA 2	\$220
Indoor driptight & dusttight NEMA 12	\$910
Outdoor non-walkin NEMA 3R ⁽¹⁾	\$1820
Outdoor walkin NEMA 3R ⁽¹⁾	\$5410

⁽¹⁾ Cubicle space heaters included.
Power for heaters not included.

Main Bus Modifications

Table 14: Main Bus - Add Per Vertical Section

Aluminum Tin-Plated	
1000A	\$630
1200A	\$690

Copper Silver-Plated	
1000A	\$1290
1200A	\$1380
2000A	\$2580
3000A ⁽¹⁾	\$3780

Copper Ground Bus
\$90

Copper Tin-Plated	
1000A	\$900
1200A	\$990
2000A	\$1800
3000A ⁽¹⁾	\$2610

Insulated Bus	
1200A Max	\$660
2000A	\$930
3000A ⁽¹⁾	\$1860

⁽¹⁾ Requires 12" top bus addition.

Terminations

Table 15: Terminations - Add For Each Vertical Section

Incoming line section (one vertical section)	\$1600
Main bus entrance (cable connection)	\$800
Bus duct termination 1200A - indoor	\$1620
Bus duct termination 1200A - outdoor	\$2530
Bus duct termination 2000A - indoor	\$2320
Bus duct termination 2000A - outdoor	\$3230
Transformer termination - indoor	\$3400
Transformer termination - outdoor	\$4310
Roof Bushing 1200A, 3Ø - outdoor	\$9307
Match & lineup with other equipment - indoor	Consult Factory

Instrument and Control Power Transformers

Table 16a: Voltage Transformers - Each

Stationary Mounted	
2400-120 Volts	\$580
4200-120 Volts	\$780
7200-120 Volts	\$1080
For trunion (drawout) mounting (per set)	\$1200

Table 16b: Current Transformers - Each

Ground sensor	\$390
400:5A (maximum)	\$370
600:5A (maximum)	\$420
1200:5A (maximum)	\$550
2000:5A (maximum)	\$730
CT protector (thyrite)	\$400

Table 16c: Auxiliary Transformers - Each

Aux control power transformer (3kVA Max)	\$200
Aux current transformer	\$300
Aux potential transformer	\$300

Table 16d: Control Power Transformers (Stationary Mounted)

3kVA - 1Ø	\$1930
5kVA - 1Ø	\$2050
10kVA - 1Ø	\$2310
15kVA - 1Ø	\$2560
25kVA - 1Ø	\$3390
9kVA - 3Ø	\$3180
15kVA - 3Ø	\$3420
30kVA - 3Ø	\$4120
45kVA - 3Ø	\$4880
Trunion mounted fuses w/interlock	\$1690

Surge Protection Equipment

Table 17: Surge Protection Equipment - Per Set

Surge Limiter (3Ø)	\$1030
Surge Arresters (Station Class - 3Ø)	
3000 Volts	\$2100
4500 Volts	\$2320
6000 Volts	\$2450
9000 Volts	\$2560
Surge Capacitors (3Ø)	
2400 Volts	\$1380
4160 Volts	\$1580
6900 Volts	\$2100

Power Factor Correction Capacitors (3Ø)

Table 18: Power Factor Correction Capacitors - Per 3-Phase Set

25 kVAR	\$1330
50 kVAR	\$1550
75 kVAR	\$1750
100 kVAR	\$1840
125 kVAR	\$2280
150 kVAR	\$2400
175 kVAR	\$2520
200 kVAR	\$2640

Contactor Options

Table 19: Optional Contactor Features - Each

Latching for 360A contactor	\$1310
Latching for 720A contactor	\$4054
Blown fuse trip bar	\$670
Extra capacity CPT (3.25kVA Max)	\$550
50 Hertz or 3300V	\$240

Protective Relays

Table 20a: Protective Relays - Each ⁽¹⁾

	ANSI Type And Description	Industrial Class	Switchboard Class
27	Undervoltage 1Ø (time)	\$380	\$920
27/47/60	Undervolt/Ø sequence/Ø balance	\$1100	\$3040
40	Loss of Excitation Relay	\$2535	\$3550
46	Negative sequence overcurrent relay	—	\$3800
49/50	Thermal overload (ABB BL-1,2 element)	—	\$4848
49	3 input RTD relay	\$2400	—
49/50	Solid State overload relay (3UB)	\$700	—
50G	Instantaneous ground overcurrent	\$850	\$1025
51G	Time ground overcurrent	\$850	\$1025
51	Time overcurrent 1Ø	\$650	\$920
50/51	Instantaneous/Time overcurrent 1Ø	\$1275	\$1537
50/51/51G	Siemens SCOR relay 3Ø with ground	—	\$3500
55	Power factor	\$4473	—
59	Overvoltage 1Ø	\$380	\$920
81	Underfrequency	\$945	\$3500
86	Lockout (up to 8-contacts)	\$380	\$750
87M	Self balancing differential 3Ø	—	\$1940
87M	Percentage differential 3Ø	—	\$8445

⁽¹⁾ Siemens will supply the specific type and model per Siemens standard procedures.
If specific brand or model is required, consult factory.

Table 20b: Multifunction Relays

Multilin 269 relay	\$6060
Multilin 269 plus relay	\$7880
269 drawout case adder	\$2400
Multilin 139 relay	\$4800
Multilin PROTECT 4A	\$2200
Multilin 565 relay	\$8500
Metering Transducer Module (MTM)	\$2400
Multilin Relay Com™ software	\$5675
IQ 1000 relay w/o RTD module	\$4500
IQ RTD module	\$1560
GE Lodtrak IV relay	\$3900
GE CR-192 Synchronous protection relay	\$12,460

Note: Some relays may require a Ground Sensor - See Current Transformer section - Table 16b.

Instruments and Meters

Table 21: Instruments And Meters - Each

AC Ammeter	\$300
DC Shunt Ammeter	\$400
AC Voltmeter	\$300
DC Voltmeter	\$400
Wattmeter	\$920
Varmeter	\$1060
Power factor meter	\$870
Frequency meter	\$1060
Watthour meter	\$1840
Varhour meter	\$2640
Elapsed Time meter	\$200
Operations counter(electric)	\$270
Meter relay	\$1830
Siemens 4300 power meter w/ communications	\$2010
Siemens 4700 power meter w/o communications	\$2910
Siemens 4700 power meter w/ communications (IEEE RS-485 or ACCESS™ network)	\$3510
Current transducer, 1Ø, 0-1mA output ⁽¹⁾	\$450
Voltage transducer, 1Ø, 0-1mA output ⁽¹⁾	\$450
Watt transducer, 3Ø, 0-1mA output ⁽¹⁾	\$1560
Watthour transducer (pulsed output)	\$3060

⁽¹⁾ Add \$250 to list price if 4-20mA output.

Switches and Lights

Table 22: Switches And Lights - Each

Ammeter switch	\$290
Voltmeter switch	\$270
Selector switch	\$260
Pushbutton switch (oiltight)	\$70
Test switch(FT-1)	\$330
Indicating light(incandescent)	\$60
Indicating light (LED)	\$100

Control Circuit Devices

Table 23: Control Circuit Devices - Each

Auxiliary control relay (4 pole)	\$150
Auxiliary control relay (8 pole)	\$260
Auxiliary control relay (6 pole switchboard)	\$750
Timing relay (pneumatic)	\$400
Timing relay (solid state)	\$200
Time Delay Undervoltage Restart (TDUV)	\$800
Panelboard with 100A main breaker ⁽¹⁾	\$950
Molded case circuit breaker 1 pole	\$80
Size 1 combination starter (10Hp @ 480V)	\$980
Size 2 combination starter (25Hp @ 480V)	\$1100
Test blocks	\$200
Kirk lock, per cylinder	\$330

⁽¹⁾ Add appropriate number of breakers to panelboard price to complete panelboard.

Cubicle Modifications

Table 24: Cubicle Modifications - Per Controller

Device Nameplates (exterior only)	\$200
Device Nameplates (exterior & interior)	\$400
Wiremarkers (sleeve type)	\$400
Heater (indoor adder)	\$180
Thermostat (fixed disk type)	\$75
Special wire (size or type - standard is 14AWG type AWM)	\$200
Terminal blocks (special)	\$220
CA or Chicago Code	\$330
Seismic (Zone 4 structural only)	\$140

Spare Parts and Accessories

Table 25 a: Contactors And Accessories - Each ⁽¹⁾

Drawout 360A contactor w/o fuses	\$5580
Stationary 720A contactor w/o fuses	\$8174
Drawout 720A fuse carriage w/o fuses	\$1175
Contactor lift device	\$1760
Contactor service platform	\$800
Contactor lift adapter for GM Swgr lift	\$650
Stationary power cell for 360A contactor	\$2925

⁽¹⁾ For purchase only with a complete group of controllers purchased on same transaction.
For contactors for use with existing equipment, contact factory.

Table 25 b - Primary Fuses - Each

2R, 3R or 4R fuse	\$130
6R, 9R or 12R fuse	\$270
18R or 24R fuse	\$450
38R fuse	\$1040
57R fuse	\$1475
100E max fuse	\$150
200E max fuse	\$330
450E max fuse	\$580
750E max fuse	\$1160
1100E max fuse	\$2760
VT fuse	\$100
Contactor CPT fuse	\$60
Power factor correction capacitor fuse	\$150

Table 25 c - Contactor Control Power Transformers

3/4kVA	\$600
1.5kVA	\$850
3.25kVA	\$1250

Table 25 d - Test Plugs

For current and potential test blocks	\$240
For switchgear class relays	\$290

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