



SMC PLUS™
Smart Motor Controller:

Allen-Bradley

Accu-Stop™ Option Manual

Wiring and Set-up Procedures
24-1000 Amps
(Bulletin 150)

This is a supplementary guide for the Accu-Stop Option, it is intended to be used with the Installation Manual. This guide contains the information pertaining to the wiring and customer adjustment set-up procedures for the Accu-Stop Option. Other information specific to the operation and maintenance of the SMC PLUS is given in the following Installation Manuals :

150-811 (24, 35, 54, 97, 135 Amps)

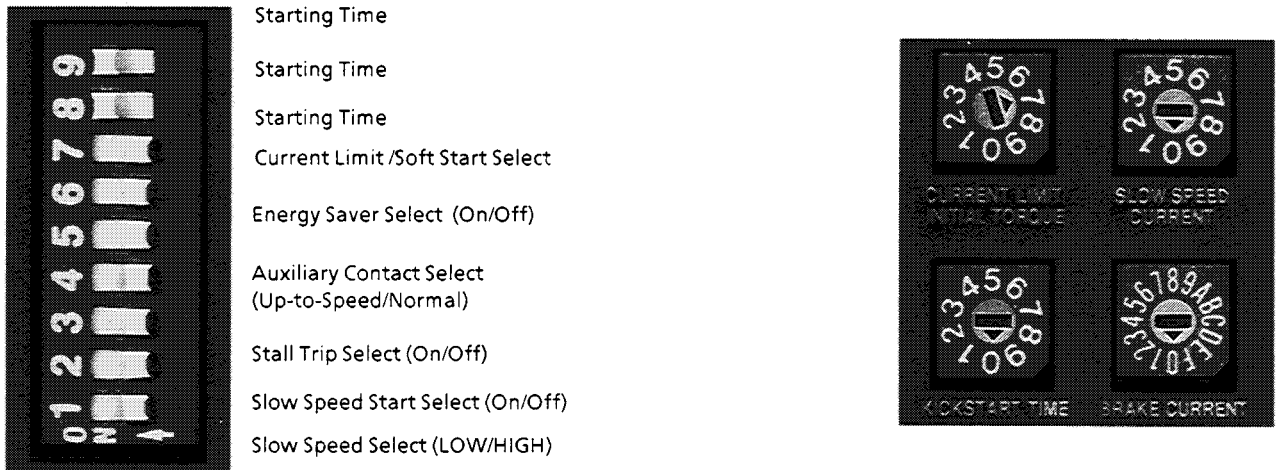
150-812 (180, 240, 360 Amps)

150-813 (500, 650, 720, 850, 1000 Amps)

For Bulletin 150 SMC Smart Motor Controller technical support on start-up or existing installations, contact your Allen-Bradley representative. In the United States you can also call 1-800-765-SMCS (765-7627) for assistance during the hours of 8:00 am to 12:00 noon and 1:00 pm to 4:30 pm (Central Time Zone) from Monday through Friday.

Accu-Stop Option

Figure 1.1 Accu-Stop Option Factory Settings



Factory Settings

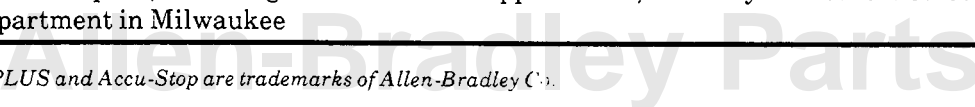
The controller has been factory-set for the following as shown in Figure 1.1 above:

- 10 second ramp
- Energy Saver "OFF"
- Auxiliary Contacts "OFF" (Normal)
- Stall feature "OFF"
- Initial Torque 70%
- Kickstart "OFF"
- Slow Speed Start "OFF"
- Slow Speed "HIGH"
- Slow Speed Current "OFF"
- Brake Current "OFF"

NOTE: Accu-Stop feature is deactivated with factory settings.

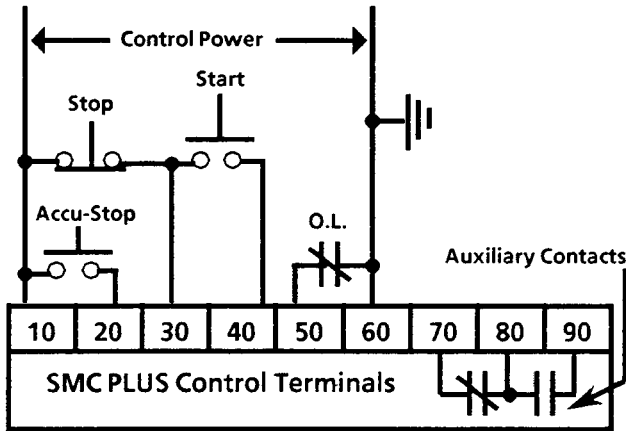
Application Considerations

For multispeed, reversing and multimotor applications, consult your nearest Sales Offices or the Sales Department in Milwaukee



Accu-Stop Option

Figure 1.2 - Accu-Stop Terminal Wiring



The Accu-Stop function can control loads which have no more than five times motor inertia measured at the motor shaft. Operation is not recommended for loads with greater than five times motor inertia reflected to motor shaft.



WARNING: The Accu-Stop option is not intended to be used as an emergency stop. Refer to the applicable standards for emergency stop requirements.

NOTE: Depending on the application, the SMB Smart Motor Braking, Accu-Stop, and Slow Speed with Braking options may cause some vibration or noise during the stopping cycle and this may be minimized by lowering the braking current. If this is a concern in your application, consult the factory prior to applying these options.

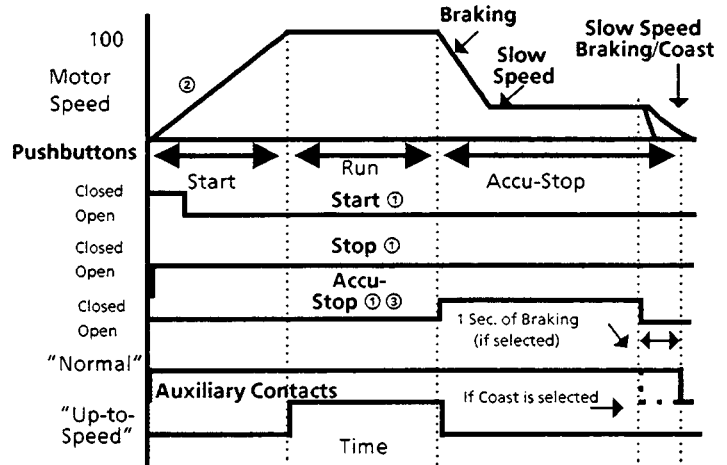


CAUTION: Slow speed running is not intended for continuous operation due to heat produced in the motor and reduced motor cooling. Therefore, select the lowest slow speed current setting that will accelerate and drive the load.

This function provides motor braking and preset slow speed. The Accu-Stop option provides a method to brake a motor from full speed to a slow speed, and to stop for positioning, as shown in Figure 1.3. Braking current is adjustable from 150% to 400%. Slow speed current is adjustable from 50% to 450% of full load current. Slow speed can be selected for either 7% (LOW) or 15% (HIGH) operation.

Referring to Figure 1.2 and 1.3, to start the motor press the Start pushbutton and the motor will accelerate to full speed as selected. For stopping the motor, press and hold the Accu-Stop pushbutton.

Figure 1.3 - Accu-Stop Option

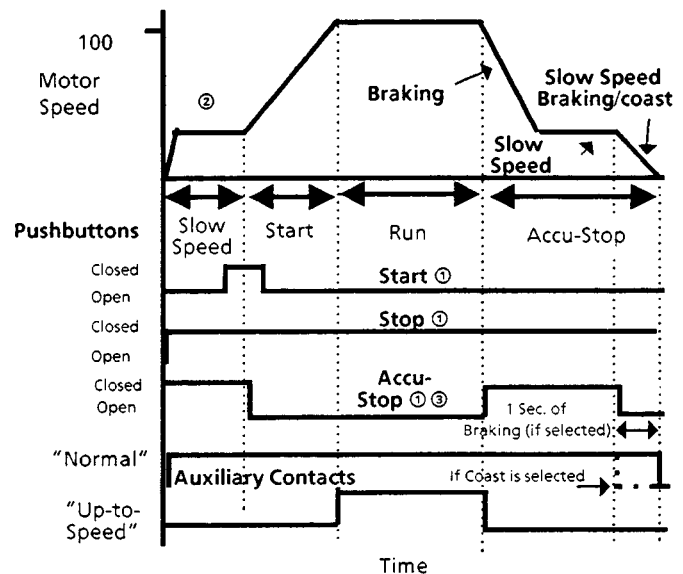


- ① Refer to Figure 1.2 for Wiring Diagram
- ② Slow Speed Start Select (DIP switch 2 "OFF")
- ③ When Accu-Stop pushbutton is closed, start/stop function is disabled

The motor will brake to slow speed and operate until the Accu-Stop pushbutton is released. If the motor does not operate at slow speed, then increase the slow speed current settings. After the Accu-Stop pushbutton is released, the motor will brake for one second or coast as selected.

Accu-Stop with Slow Speed at Start

Figure 1.4 Accu-Stop Option with Slow Speed at Start



- ① Refer to Figure 1.2 for Wiring Diagram
- ② Slow Speed Start Select "ON"
- ③ When Accu-Stop pushbutton is closed, start/stop function is disabled.

Accu-Stop Option with Slow Speed at Start (continued)

Referring to Figure 1.2 and 1.4, if the Accu-Stop pushbutton (Slow Speed) is pressed and held, the motor will operate at slow speed when Slow Speed Start is selected.

To go from slow speed to full speed, press the Start pushbutton and then release the Accu-Stop (Slow Speed) pushbutton.

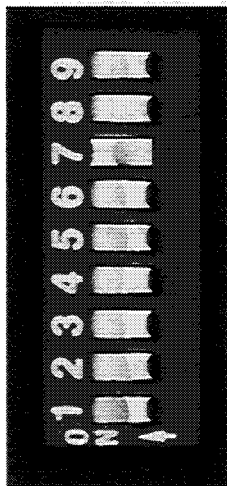
The operation of Accu-Stop from full speed to stop is the same as explained on the previous page.

If immediate transition from slow speed start to full speed is not required, release the Accu-Stop (Slow Speed) pushbutton before pushing the Start pushbutton. The motor will coast or brake to rest depending on the Brake Current setting. This is similar to the Preset Slow Speed option.

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Soft Start Selection with Accu-Stop Option

Figure 1.5 - Set Up Procedures - Soft Start Selection with Accu-Stop Option



- Starting Time
- Starting Time
- Starting Time
- Current Limit /Soft Start Select
- Energy Saver Select (On/Off)
- Auxiliary Contact Select (Up-to-Speed/Normal)
- Stall Trip Select (On/Off)
- Slow Speed Start Select (On/Off)
- Slow Speed Select (LOW/HIGH)

EXAMPLE: Above DIP switch is set for 20 second ramp

Switch Number	TIME (seconds)					
	2	5	10	20	25	30
9	ON	Off	ON	Off	ON	Off
8	Off	ON	ON	Off	Off	ON
7	Off	Off	Off	ON	ON	ON
6	Off					
5	ENERGY SAVER SELECT					
4	AUXILIARY CONTACT SELECT					
3	STALL SELECT					
2	SLOW SPEED START SELECT					
1	SLOW SPEED SELECT (LOW/HIGH)					

1. **Starting Time -**
Set switches 7-9 according to the period desired. For example, if you want a ramp of 20 seconds, switch 7 would be ON and switches 8 and 9 would be OFF.
2. **Kickstart Time -**
Set Kickstart Time rotary digital switch to the time desired.
3. **Initial Torque -**
Set Initial Torque rotary digital switch to the value desired.
4. **Current Limit/Soft Start -**
For soft start operation, switch 6 must be OFF.
5. **Energy Saver Select -**
Set switch 5 ON if you want the energy saver feature (or OFF if you do not want this feature active).
6. **Auxiliary Contact Select -**
Set switch 4 OFF if you want "normal" auxiliary contacts, ON if you want "up-to-speed" auxiliary contacts.
7. **Stall Select -**
Set switch 3 ON if you want the stall feature (or OFF if you do not want this feature active). **NOTE:** For resistive load operation, switch 3 must be OFF.
8. **Slow Speed Start Select -**
Set switch 2 ON for slow speed at start and OFF for no slow speed at start.
9. **Slow Speed Select -**
Set switch 1 for the desired preset slow speed: ON for 7% (LOW) and OFF for 15% (HIGH) of base speed.
10. **Slow Speed Current Select -**
Set Slow Speed Current rotary digital switch for preset slow speed current. Adjust until operation is satisfactory. Zero position disables slow speed and braking functions.
11. **Brake Current Select -**
Set Brake Current rotary digital switch for the desired performance. Switch settings 0-7 will provide braking current until slow speed is reached. When the Accu-Stop pushbutton is released (Open), the motor will coast.

Settings 8-F will provide braking current until slow speed is reached. When the Accu-Stop pushbutton is released (Open), the controller will provide braking current for one second to stop the motor.

**Soft Start Selection with
Accu-Stop Option (continued)**

Figure 1.6 - Set Up Procedures - Soft Start Selection with Accu-Stop Option

Kickstart Time

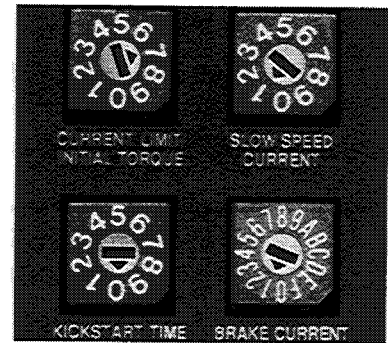
Position	0	1	2	3	4	5	6	7	8	9
Time (seconds)	Off	.4	.6	.8	1.0	1.2	1.4	1.6	1.8	2.0

Initial Torque

Position	0	1	2	3	4	5	6	7	8	9
%of Locked Rotor Torque	5	10	20	30	40	50	60	70	80	90

Slow Speed Current

Position	0	1	2	3	4	5	6	7	8	9
%of Full Load Current	Off	50	100	150	200	250	300	350	400	450



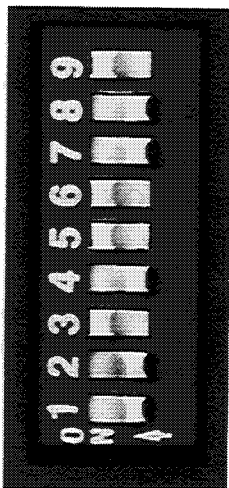
Example: Slow Speed Current rotary digital switch is set to 50% and Brake Current rotary digital switch is set at 175%, with coast from slow speed.

Position	Brake Current and Slow Speed Coast							Brake Current and Slow Speed Brake								
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
%of Locked Rotor Current	150	170	200	225	250	300	350	400	150	175	200	225	250	300	350	400

**Current Limit Selection
with Accu-Stop Option**

Figure 1.7 - Set Up Procedures - Current Limit Selection with Accu-Stop Option

- Starting Time -**
Set switches 7-9 according to the time desired. **For example**, if you want current limit active for 30 seconds, switch 9 would be ON and switches 7 and 8 would be OFF.
- Kickstart Time -**
Set Kickstart Time rotary digital switch to 0.
- Current Limit/Soft Start -**
Switch 6 must be ON in the current limit mode. Set Current Limit rotary digital switch accordingly. **For example**, if you want to restrict the starting current to 300% of full load amperes, set rotary switch to position 5.
- Energy Saver Select -**
Set switch 5 ON if you want the energy saver feature (or OFF if you do not want this feature active).
- Auxiliary Contact Select -**
Set switch 4 OFF if you want "normal" auxiliary contacts, ON if you want "up-to-speed" auxiliary contacts.
- Stall Select -**
Set switch 3 ON if you want the stall feature (or OFF if you do not want this feature active).
NOTE: For resistive load operation, switch 3 must be OFF.
- Slow Speed Start Select -**
Set switch 2 ON for slow speed at start and OFF for no slow speed at start.



- Starting Time
- Starting Time
- Starting Time
- Current Limit /Soft Start Select
- Energy Saver Select (On/Off)
- Auxiliary Contact Select (Up-to-Speed/Normal)
- Stall Trip Select (On/Off)
- Slow Speed Start Select
- Slow Speed Select (LOW/HIGH)

Example: Above Dip switch is set for 30 second current limit

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**Current Limit Selection with
Accu-Stop Option (continued)**

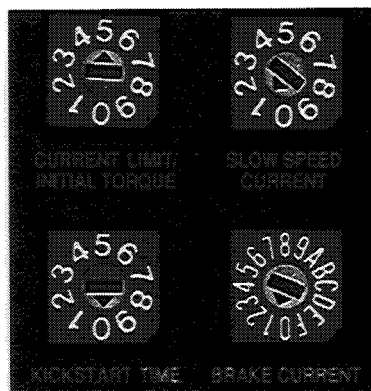
8. **Slow Speed Select** -
Set switch 1 for the desired preset slow speed: ON for 7% (LOW) and OFF for 15% (HIGH) of base speed.
9. **Slow Speed Current Select** -
Set Slow Speed Current rotary digital switch for preset slow speed current. Adjust until operation is satisfactory. Zero position disables slow speed and braking functions.
10. **Brake Current Select** -
Set Brake Current rotary digital switch for the desired performance. Switch settings 0-7 will provide braking current until slow speed is reached. When the Accu-Stop pushbutton is released (Open), the motor will coast.

Settings 8-F will provide braking current until slow speed is reached. When the Accu-Stop pushbutton is released (Open), the controller will provide braking current for one second to stop the motor.

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Figure 1.8 - Set Up Procedures - Current Limit Selection with Accu-Stop Option

Switch Number	TIME (seconds)		
	15	30	
9	Off	ON	
8	Off		
7	Off		
6	ON		
5	ENERGY SAVER SELECT		
4	AUXILIARY CONTACT SELECT		
3	STALL SELECT		
2	SLOW SPEED AT START		
1	SLOW SPEED SELECT		



Example: Slow Speed Current rotary digital switch is set to 50% and Brake Current rotary digital switch is set at 175%, with coast from slow speed.

Kickstart Time

Position	0	1	2	3	4	5	6	7	8	9
Time (seconds)	Off	.4	.6	.8	1.0	1.2	1.4	1.6	1.8	2.0

Current Limit

Position	0	1	2	3	4	5	6	7	8	9
% of Full Load Current	50	100	150	200	250	300	350	400	450	500

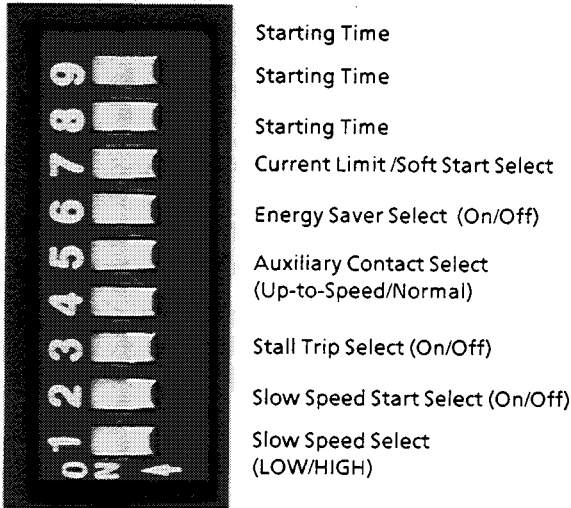
Slow Speed Current

Position	0	1	2	3	4	5	6	7	8	9
% of Full Load Current	Off	50	100	150	200	250	300	350	400	450

Position	Brake Current and Slow Speed Coast								Brake Current and Slow Speed Brake							
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
% of Full Load Current	150	175	200	225	250	300	350	400	150	175	200	225	250	300	350	400

**Full Voltage Selection
with Accu-Stop Option**

Figure 1.9 - Set Up Procedures - Full Voltage Selection with Accu-Stop Option



EXAMPLE: Above DIP switch is set for full voltage start

Switch Number	TIME (seconds)
	1/4
9	Off
8	Off
7	Off
6	Off
5	ENERGY SAVER SELECT
4	AUXILIARY CONTACT SELECT
3	STALL SELECT
2	SLOW SPEED START SELECT
1	SLOW SPEED SELECT (LOW/HIGH)

- Starting Time** - Set dip switches 7-9 OFF and switch 6 off.
- Kickstart Time** - Set to 0.
- Initial Torque** - Set to 9.
- Current Limit/Soft Start** - For full voltage operation, switch 6 must be **OFF**.
- Energy Saver Select** - Switch 5 must be **OFF**. Energy Saver feature is not available with full voltage start.
- Auxiliary Contact Select** - Set switch 4 **OFF** if you want "normal" auxiliary contacts, **ON** if you want "up-to-speed" auxiliary contacts.
- Stall Select** - Set switch 3 **ON** if you want the stall feature (or **OFF** if you do not want this feature active).
NOTE: For resistive load operation, switch 3 must be **OFF**.
- Slow Speed Start Select** - Set switch 2 **ON** for slow speed at start and **OFF** for no slow speed at start.
- Brake Current Select** - Set Brake Current rotary digital switch for the desired performance. Switch settings 0-7 will provide braking current until slow speed is reached. When the Accu-Stop pushbutton is released (Open), the motor will coast. Settings 8-F will provide braking current until slow speed is reached. When the Accu-Stop pushbutton is released (Open), the controller will provide braking current for one second to stop the motor.

Kickstart Time

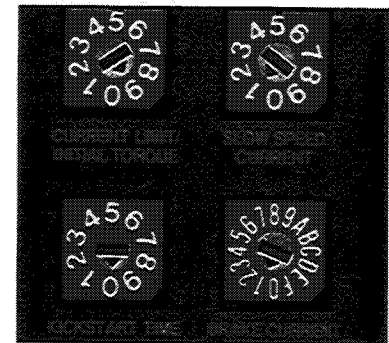
Position	0	1	2	3	4	5	6	7	8	9
Time (seconds)	Off	.4	.6	.8	1.0	1.2	1.4	1.6	1.8	2.0

Initial Torque

Position	0	1	2	3	4	5	6	7	8	9
% of Locked Rotor Torque	5	10	20	30	40	50	60	70	80	90

Slow Speed Current

Position	0	1	2	3	4	5	6	7	8	9
% of Full Load Current	Off	50	100	150	200	250	300	350	400	450



Example: Slow Speed Current rotary digital switch is set to 50% and Brake Current rotary digital switch is set at 175%, with coast from slow speed.

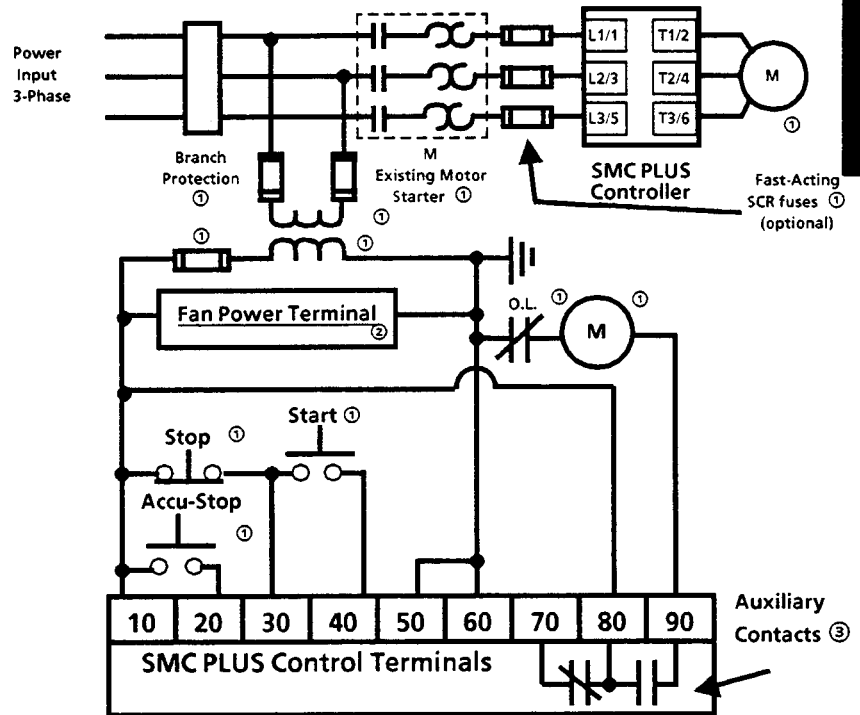
Position	Brake Current and Slow Speed Coast							Brake Current and Slow Speed Brake								
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
% of Full Load Current	150	175	200	225	250	300	350	400	150	175	200	225	250	300	350	400

**Typical Connection
for Retrofit Application**

Figure 1.10 - Typical Connection
Diagram Retrofit Application

Typical connection diagram for retrofit applications: Figure 1.10 shows the typical diagram to use when retrofitting a SMC PLUS with the Accu-Stop Option into an existing control scheme. Starting and stopping of the motor is handled by the controller. Be sure the ingoing side of the starter coil is routed through terminals 80 and 90 to insure the starter stays on long enough to allow stopping to occur and that the auxiliary is configured for normal operations.

- ① Customer Supplied
- ② Customer wires fan to control voltage supply. For 97A controllers and up, see installation manuals for jumper locations and wiring diagrams.
- ③ Set auxiliary contacts for normal setting.



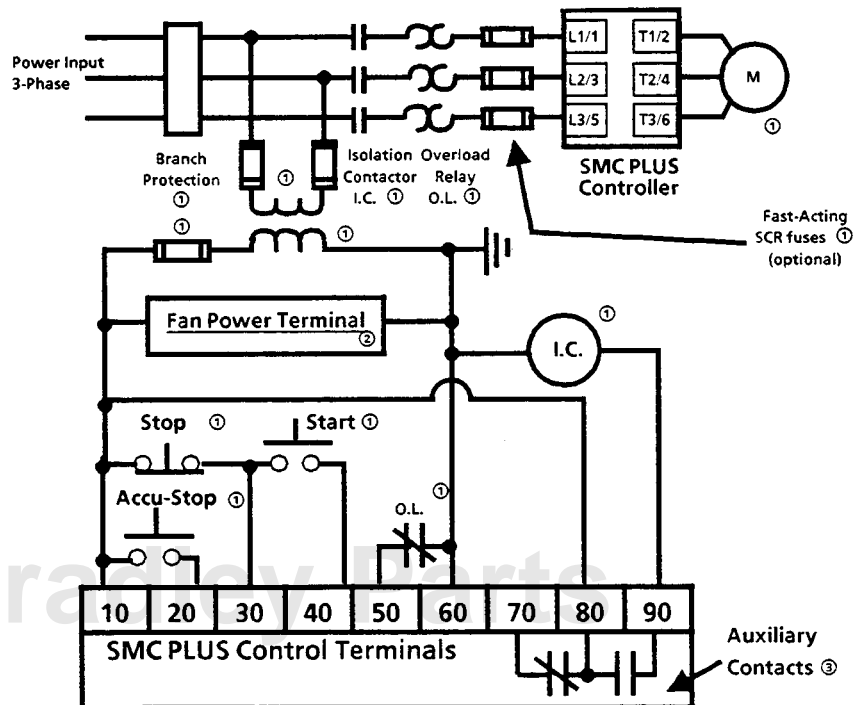
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**Typical Connection
with Isolation Contactor**

Figure 1.11 - Typical Connection
with Isolation Contactor

Typical connection diagram for the Accu-Stop option with isolation contactor: Both starting and stopping of the motor is controlled by the controller. The controller also controls the electromechanical contactor. The contactor provides isolation between the motor and power lines when controller is OFF.

- ① Customer Supplied
- ② Customer wires fan to control voltage supply. For 97A controllers and up, see installation manuals for jumper locations and wiring diagrams.
- ③ Set auxiliary contacts for normal setting.



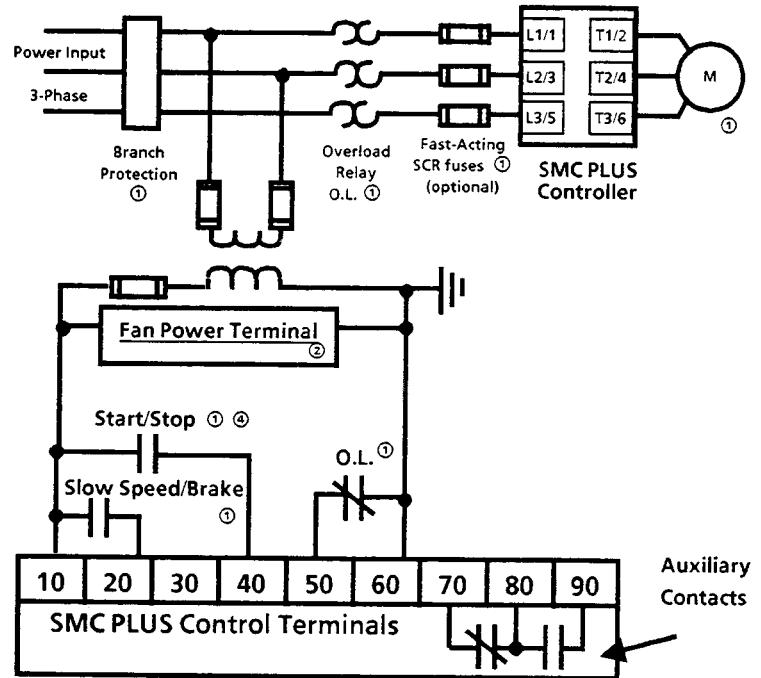
Programmable Controller and Sensor Interface

When using solid-state devices to operate the SMC PLUS controller the voltage and frequency range will be 100-240V, 50/60 Hz. The OFF state leakage current from the solid-state device must be less than 6 mA. The nominal input current is 25mA at 120 VAC and 50 mA at 240 VAC.

Figure 1.12 - Typical Connection
with PLC or other Logic Devices

NOTE:

- ① Customer Supplied
- ② Customer wires fan to control voltage supply. For 97A controllers and up, see installation manuals for jumper locations and wiring diagrams.
- ③ Disconnect main power before servicing motor controller or associated wiring. Hazardous voltages are present in the motor circuit even when the solid-state controller is off.
- ④ Must remain closed for duration of braking and final slow speed. Auxiliary contacts may be used for completion signal, refer to Figures 1.3 and 1.4 for timing information.





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