



SMC PLUS™
Smart Motor Controller:

Allen-Bradley

Preset Slow Speed Option Manual

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

This is a supplementary guide for the Preset Slow Speed 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 Preset Slow Speed 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)

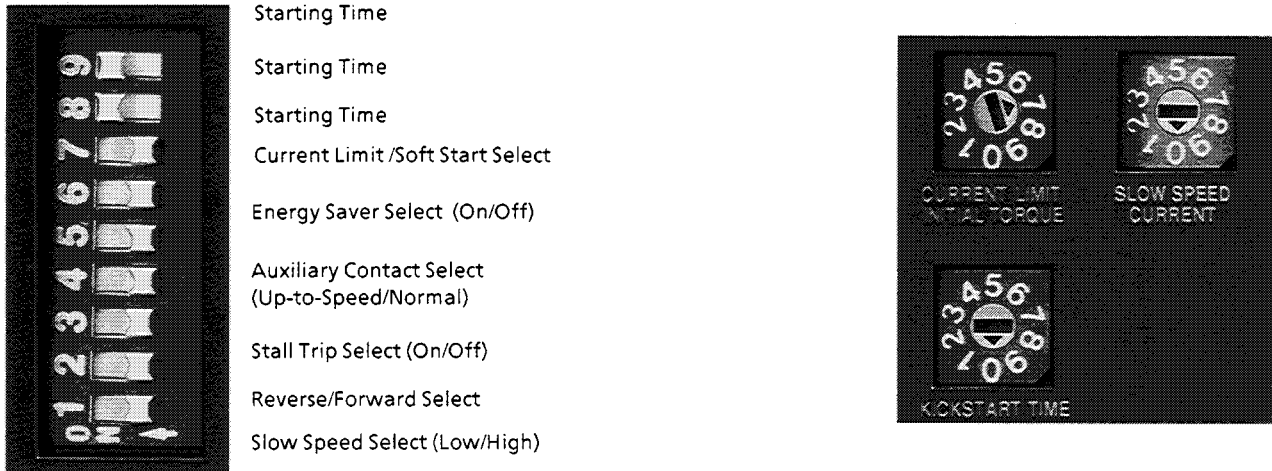
150-812 (180, 240, 360 Amps)

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.

Preset Slow Speed Option

Figure 1.1 - Preset Slow Speed 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"
- Preset Speed set for "FORWARD" direction and "HIGH" speed
- Slow Speed Current adjustment "OFF"

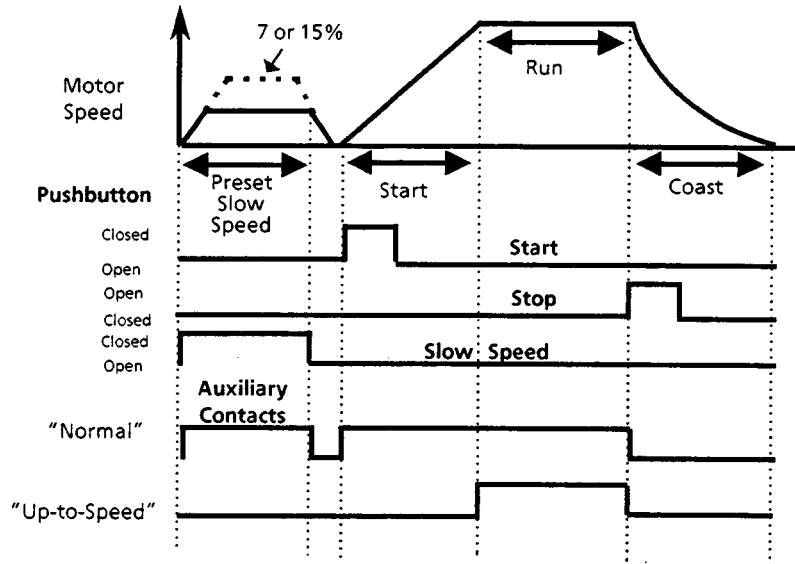
NOTE: Preset Slow Speed feature is deactivated with factory settings.

Application Considerations

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

Preset Slow Speed Option

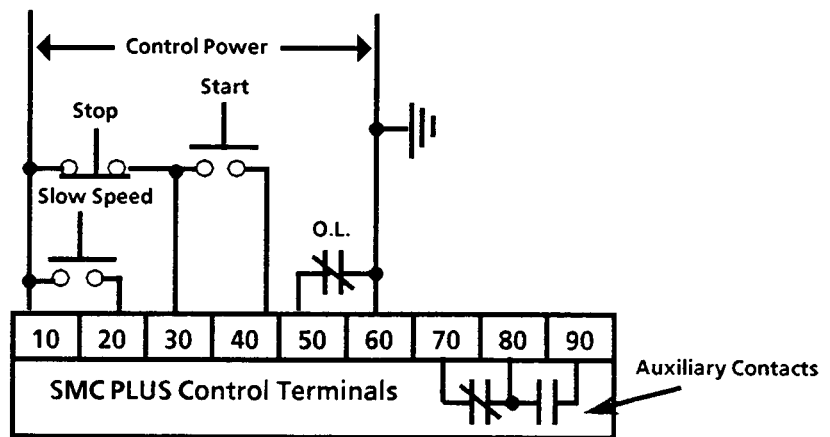
Figure 1.2 - Preset Slow Speed Option



Ⓢ Refer to Figure 1.3 for Wiring Diagram

With the preset slow speed feature, pressing and holding in the slow speed pushbutton will allow the motor to operate at the selected slow speed. The RUNNING LED will flash indicating this preset slow speed operation. By releasing the slow speed pushbutton, the RUNNING LED turns off and the motor will coast to rest. If the start pushbutton is pressed, the motor will accelerate to full speed based on the starting mode selected.

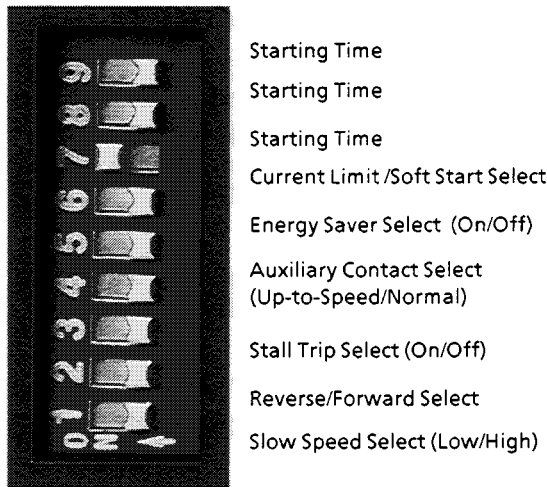
Figure 1.3 - Preset Slow Speed Terminal Wiring



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.

**Soft Start Selection with
Preset Slow Speed**

**Figure 1.4 - Set Up Procedures - Soft Start
Selection with Preset Slow Speed Option**



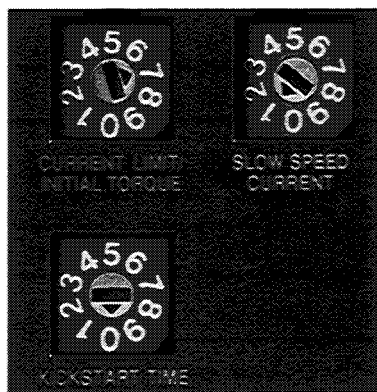
EXAMPLE: Above DIP switch is set for 20 second ramp

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	REVERSE/FORWARD SELECT					
1	SLOW SPEED SELECT (LOW/HIGH)					

- 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.
- Kickstart Time -**
Set Kickstart Time rotary digital switch to the kickstart time desired.
- Initial Torque -**
Set Initial Torque rotary digital switch to the value desired.
- Current Limit/Soft Start -**
For soft start operation, switch 6 must be OFF.
- 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.
- Reverse/Forward Slow Speed Select -**
Set DIP switch 2 for direction according to rotation desired at slow speed.
- Slow Speed Select -**
Set DIP switch 1 for Preset Slow Speed according to speed required. **Forward Direction:** ON for 7% (LOW) or OFF for 15% (HIGH) of base speed. **Reverse Direction:** ON for 10% (LOW) or OFF for 20% (HIGH) of base speed.
- Slow Speed Current -**
Set Slow Speed Current rotary digital switch for desired current. **For example,** if you want slow speed current of 50%, set rotary digital switch to 1.



WARNING: The user has the ultimate responsibility to determine which stopping mode is best suited to the application and will meet applicable standards for operator safety on a particular machine.



EXAMPLE: Slow Speed Current rotary digital switch is set to 50% of full load current

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

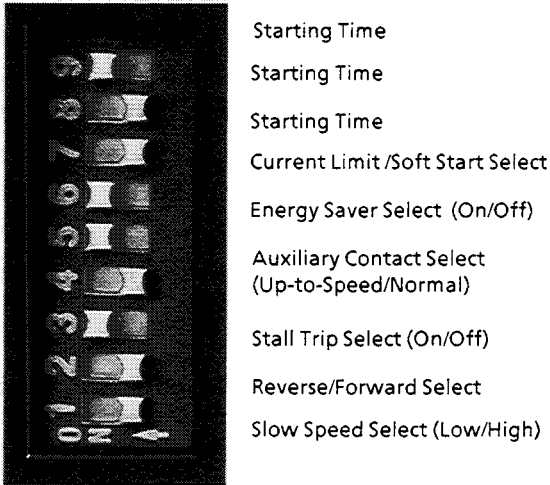
Slow Speed Current

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

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**Current Limit Selection with
Preset Slow Speed**

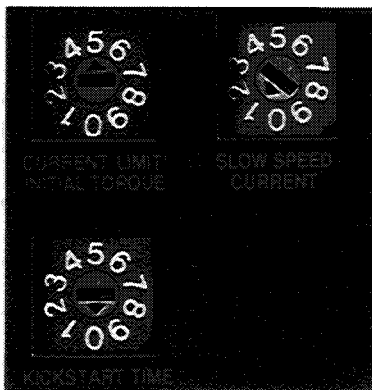
Figure 1.5 - Set Up Procedures - Current Limit Selection with Preset Slow Speed Option



EXAMPLE: Above DIP switch is set for 30 second current limit time

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	REVERSE/FORWARD SELECT	
1	SLOW SPEED SELECT (LOW/HIGH)	

1. **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**.
2. **Kickstart Time -**
Set Kickstart Time rotary digital switch to **OFF**.
3. **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
4. **Energy Saver Select -**
Set switch 5 **ON** if you want the energy saver feature (or **OFF** if you do not want this feature active)
5. **Auxiliary Contact Select -**
Set switch 4 **OFF** if you want "normal" auxiliary contacts, **ON** if you want "up-to-speed" auxiliary contacts
6. **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**
7. **Reverse/Forward Slow Speed Select -**
Set DIP switch 2 for direction according to rotation desired at slow speed
8. **Slow Speed Select -**
Set DIP switch 1 for Preset Slow Speed according to speed required. **Forward Direction:** **ON** for 7% (LOW) or **OFF** for 15% (HIGH) of base speed. **Reverse Direction:** **ON** for 10% (LOW) or **OFF** for 20% (HIGH) of base speed.
9. **Slow Speed Current -**
Set Slow Speed Current rotary digital switch for desired current. **For example**, if you want slow speed current of 50%, set rotary digital switch to 1



EXAMPLE: Slow Speed Current rotary digital switch is set to 50% of full load current

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 Amps	50	100	150	200	250	300	350	400	450	500

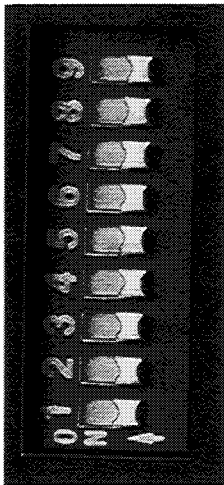
Slow Speed Current

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

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**Full Voltage Selection with
Preset Slow Speed**

Figure 1.6 - Set Up Procedures - Full Voltage Selection with Preset Slow Speed 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)
- Reverse/Forward Select
- Slow Speed Select (Low/High)

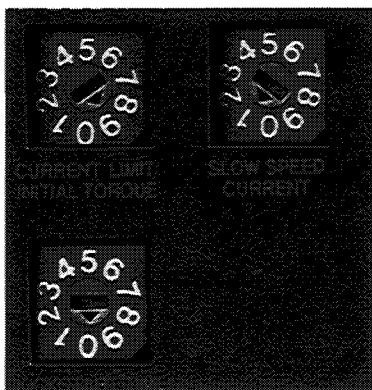
EXAMPLE: Above DIP switch is set for full voltage start

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	REVERSE/FORWARD SELECT
1	SLOW SPEED SELECT (LOW/HIGH)

1. **Starting Time -**
Set dip switches 7-9 **OFF** and switch 6 **OFF**.
2. **Kickstart Time -**
Set to 0.
3. **Initial Torque -**
Set to 9.
4. **Current Limit/Soft Start -**
For full voltage operation, switch 6 must be **OFF**.
5. **Energy Saver Select -**
Switch 5 must be **OFF**. Energy Saver is not available.
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. **Reverse/Forward Slow Speed Select -**
Set DIP switch 2 for direction according to rotation desired at slow speed.
9. **Slow Speed Select -**
Set DIP switch 1 for Preset Slow Speed according to speed required. **Forward Direction:** **ON** for 7% (LOW) or **OFF** for 15% (HIGH) of base speed. **Reverse Direction:** **ON** for 10% (LOW) or **OFF** for 20% (HIGH) of base speed.
10. **Slow Speed Current -**
Set Slow Speed Current rotary digital switch for desired current. **For example,** if you want slow speed current of 50%, set rotary digital switch to 1.



WARNING: The user has the ultimate responsibility to determine which stopping mode is best suited to the application and will meet applicable standards for operator safety on a particular machine.



EXAMPLE: Slow Speed Current rotary digital switch is set to 50% of full load current

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

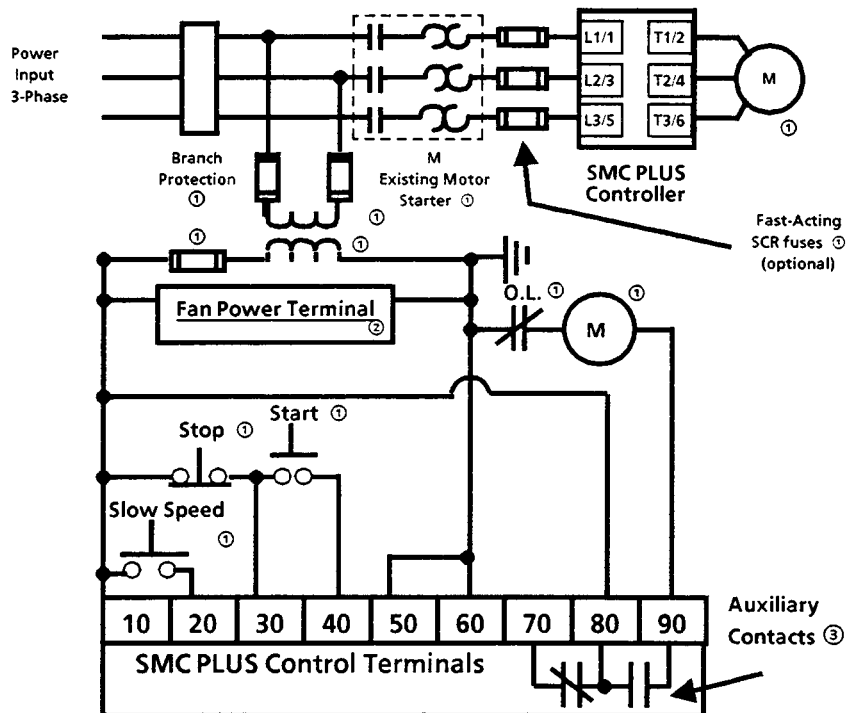
**Typical Connection
for Retrofit Application**

**Figure 1.7 - Typical Connection
Diagram Retrofit Application**

NOTE: For two wire control, remove stop/start pushbuttons and connect two wire device between terminals 10 and 40.

- 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.

Typical connection diagram for retrofit applications: Figure 1.7 shows the typical diagram to use when retrofitting a SMC PLUS with Preset Slow Speed into an existing control scheme. Starting and stopping of the motor is handled by the controller. Be sure that the auxiliary is configured for normal operation.



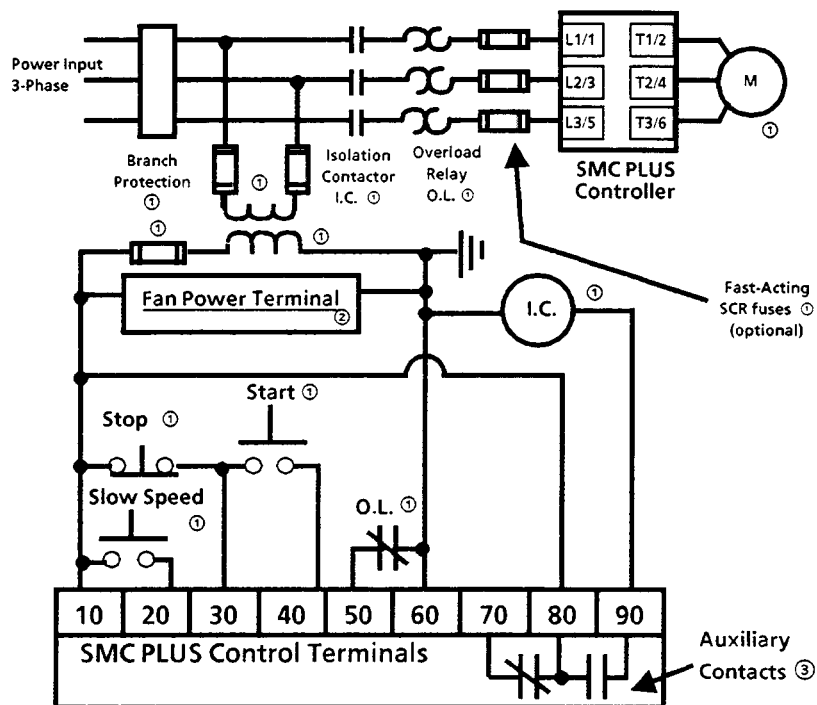
**Typical Connection
with Isolation Contactor**

**Figure 1.8 - Typical Connection
Diagram with Isolation Contactor**

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 Set auxiliary contacts for normal setting.

Typical connection diagram for Preset Slow Speed 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.



By-Pass Mode

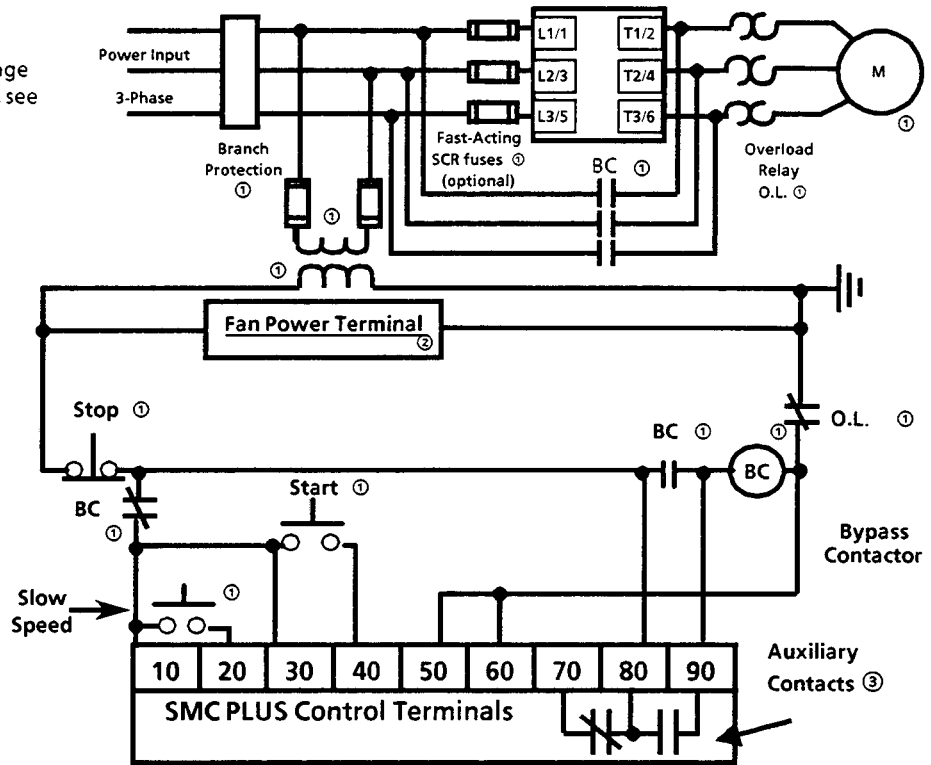
Typical connection diagram of a by-pass contactor: By using the following circuit, starting and stopping can be realized with the controller bringing the bypass contactor on for normal full speed operation.

NOTE: Because the controller is bypassed during this mode, controller features are not available when contactor is energized.

Figure 1.9 - Typical Application Diagram of a By-Pass Contactor

NOTE:

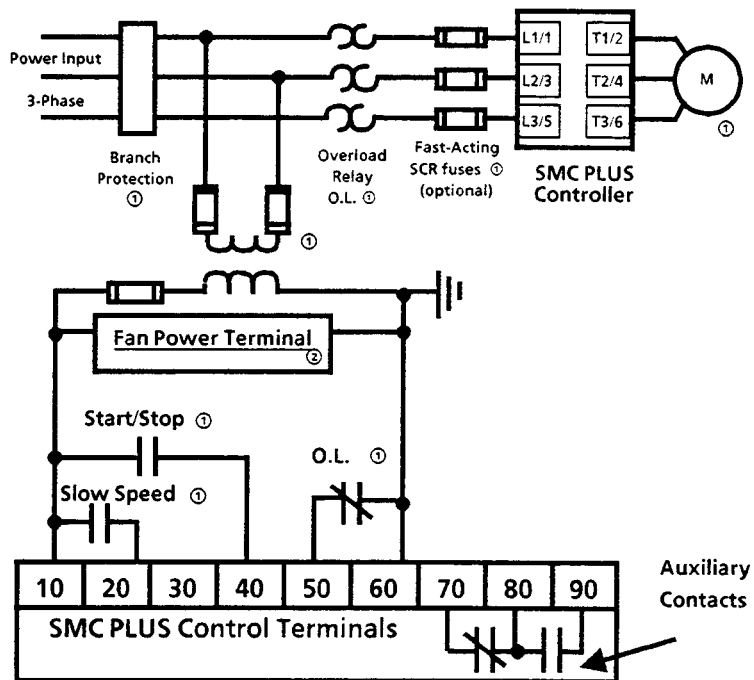
- ① Customer Supplied
- ② Customer wires fan to control voltage supply. For 97A controllers and up, see installation manuals for jumper locations and wiring diagrams.
- ③ Set auxiliary contacts for "up-to-speed" setting.



**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 1.10 - 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.



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