Title: **Stop/Start/Jog using Selector Switch for a 3P Mtr** Hands-On: 5

Course: Introduction to Automation Unit: Introduction of PLC CLO: 4

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Grade \_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall reinforce their knowledge of a stop/start/jog motor control circuit.
2. Student shall develop a knowledge of retentive timers and their use.
3. Student shall apply this circuit in a three-phase motor control scenario.

**Assessment**

Students shall demonstrate a comprehension of the objectives listed above by scoring a minimum of 75% on this Hands-On. Grading shall be based on the Introduction to PLC rubric.

**Devices**

|  |  |  |
| --- | --- | --- |
| Inputs | | |
| *Device* | *Description* | *Symbol* |
| NC Mushroom Head PB (ESTOP) | Emergency Stop | ESTOP |
| Two-position Selector Switch | Mode: 1 = Run, 0 = Jog | MODE |
| NC Pushbutton (PB1) | Stop Motor | STOP |
| NO Pushbutton (PB2) | Start/Jog Motor | START\_JOG |
| NO Contacts (MS-F-AUX) | Motor Starter Status | MS\_STAT |
| NO Contacts (MS-OL) | Motor Overload Contacts | MS\_OL |
| Outputs | | |
| *Device* | *Description* | *Symbol* |
| Green Pilot Light | Motor Running | RUNNING |
| Red Pilot Light | Motor Stopped | STOPPED |
| Yellow Pilot Light | Motor Overload | OVERLOAD |
| Blue Pilot Light | Motor Jogging | JOGGING |
| 24VDC Three-Phase Motor Starter | Motor Starter Coil | MS\_F |

**Instructions**

Design a stop/start/jog motor control circuit using the devices listed above. A selector switch shall determine if the circuit is a sealing circuit or used as a jog circuit. When the selector switch is in the A position and the start button is pressed, the motor shall start and stay running even when the button is released. When the selector switch is in the B position and the start button is pressed, the motor shall start and only run while the button is pressed. Once released, the motor shall stop. The control circuit shall also contain an overload function. If a motor overload occurs, the control circuit shall disable itself requiring the operator to press start after the overload is reset. Additionally, a retentive timer shall be used to keep track of motor run time. When the motor is running, the timer shall increment keeping track of how long the motor has been running. When the motor is off, the timer shall retain the time. If the motor is re-started, the timer will continue to time from the previously stored value. Whenever the motor has been started and keeps running, the green light shall illuminate. Whenever the motor has been jogged, the blue light shall illuminate. The green and blue light shall never be on at the same time. When the motor is not running, the red light shall illuminate. If an overload occurs, the yellow light shall illuminate. During overload, it is permissible for both the yellow and red lights to be on simultaneously.

You **must** follow this sequence;

Design a hand drawing of the proposed circuit. Review with the instructor. Initials \_\_\_\_\_

After review, then you may use the computer at your station to compose your program.

Compose the program & review with the instructor before connecting to the panel. \_\_\_\_\_

Download and test logic **without** motor connection. Review with instructor \_\_\_\_\_

Wire motor to panel. Have instructor review wiring **before energizing motor**. Initial \_\_\_\_\_

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| Input | Description | Out | Desc | Three-Phase Motor Starter |
| I/0 | ESTOP | O/0 | Green |  |
| I/1 | CR1 NO (Pins 1 & 3) | O/1 | Yellow |
| I/2 | CR2 NO (Pins 1 & 3) | O/2 | Red |
| I/3 | 3P SS, Position A (up) | O/3 | Blue |
| I/4 | 3P SS, Position B (dn) | O/4 | MS\_F Coil |
| I/5 | 2P SS, Pos. A (up)=ON | O/5 | MS\_R Coil |
| I/6 | PB1, NC |  |  |
| I/7 | PB2, NO |  |  |
| I/8 | PB3, NO |  |  |
| I/9 | MS\_OL |  |  |

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