Title: **Fwd/Rev using 1 Pushbutton and a SS for a Three-Phase Mtr** Job: 21

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

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Station \_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Objectives**

1. Student shall reinforce their knowledge of a forward/reverse motor control circuit.
2. Student shall develop a knowledge of a one-shot and the PLC scan sequence.
3. Student shall display their knowledge of decimal to binary number conversion.
4. 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 Job. Grading shall be based on the Introduction to PLC rubric.

**Instructions**

Design a forward/reverse motor control circuit using one momentary pushbutton and a three-position selector switch. The circuit will also have an “ESTOP”. The one pushbutton shall be used to both start and stop the motor. The direction change shall be determined by the three-position selector switch. “Forward” is defined by the motor to rotating counter-clockwise (CCW). “Reverse” is defined by the motor to rotating clockwise (CW). If the motor is running and the operator changes direction through the selector switch, the circuit shall not re-engage the motor in the opposite direction for eight seconds. Once the timer delay is complete, the motor shall automatically start in the newly commanded direction. The operator should not have to wait for the timer to complete and then press the pushbutton. If the operator pressed the pushbutton to stop the motor then restarts the motor without a direction change, no time delay is required. Additionally, the program shall keep track of the number of starts in the forward direction and the number of starts in the reverse direction. The counts shall be resettable using the two-position selector switch. The green light shall indicate “forward”, the blue light shall indicate “reverse”, the red light shall indicate “stopped”. 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. If the motor is in the “direction change” time period, the new direction light should flash until the time has expired. When expired, that direction’s light shall remain on solid while the motor is running in that direction. Once complete, review the design with the instructor. After obtaining approval, configure the program in RSLogix 500. Have the instructor review the program before downloading. After review, download the program.

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| --- | --- | --- | --- | --- |
| Input | Description | Output | Desc | Three-Phase Motor Starters |
| I/0 | ESTOP | O/0 | Green |  |
| I/1 | 3P SS, Position A | O/1 | Yellow |
| I/2 | 3P SS, Position B | O/2 | Red |
| I/3 | 2P SS, Pos. A =ON | O/3 | Blue |
| I/4 | PB1, NC | O/4 | FWD Coil |
| I/5 | PB2, NO | O/5 | REV Coil |
| I/6 | PB3, NO |  |  |
| I/7 | Forward NO Contacts |  |  |
| I/8 | Overload NC Contacts |  |  |
| I/9 | Reverse NO Contacts |  |  |

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Discussed design \_\_\_\_\_\_\_, Test logic without motor \_\_\_\_\_\_\_, With motor \_\_\_\_\_\_\_