Title: **Fwd/Rev/Jog using 2 Pushbuttons & 2 SS for a 3P Motor** Job: 23

Course: Introduction to Automation Unit: Introduction of PLC CLO: 2, 4

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

**Objectives**

1. Student shall reinforce their knowledge of a forward/reverse/jog motor control circuit.
2. Student shall develop a knowledge of counters and timer 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 Job. Grading shall be based on the Introduction to PLC rubric.

**Instructions**

Design a forward/reverse/jog motor control circuit using two momentary pushbuttons, a two-position selector switch and a three-position selector switch. The circuit will also have an “ESTOP”. One pushbutton shall be used as a traditional “stop”. The other pushbutton shall be a traditional “start”. If the two-position selector switch is in the “A” position, the motor shall seal in when the “start” button is pressed. If the two-position selector switch ins in the “B” position, the “start” button shall act as a “jog” button. The direction change shall be determined by the three-position selector switch. 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 presses 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 a pushbutton other than the “start” and “stop” pushbuttons. Additionally, if the motor is commanded to run in either direction but does not receive confirmation from the field within 4 seconds, the circuit shall stop the motor. 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 flash. 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 direction light (green or blue) shall flash until the time has expired. If the circuit times out on lack of field confirmation, the red light shall flash.

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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 \_\_\_\_\_\_\_