Title: **Forward-Reverse-Jog using 3 PBs & 3 Position SS** Hands On: 4

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

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

**Objectives**

1. Student shall demonstrate their knowledge of a fwd/rev/jog motor control circuit.
2. Student shall convey their knowledge of how to create fwd/rev/jog motor circuit using three pushbuttons and a selector switch.
3. Student shall construct this circuit in either a 1P or 3P 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.

**Instructions**

Design a forward/reverse/jog motor control circuit using three momentary pushbuttons and a three-position selector switch. The circuit will also utilize a latching mushroom head pushbutton to act as an “ESTOP”. One pushbutton shall perform a “stop” function. When this button is pressed, the motor shall stop running regardless of direction. The second pushbutton shall function as a “start” button. When this button is pressed, the motor shall start and run in the commanded direction even if the button is no longer pressed. The third pushbutton shall function as a “jog” button. When this button is pressed, the motor shall start and run in the commanded direction only while the button is pressed. The three-position selector switch shall function as a directional selector. When the switch is in the “A” position, the motor shall run clockwise (CW) when the start or jog button is pressed. When the switch is in the “B” position, the motor shall run counter clockwise (CCW) when the start or jog button is pressed. If the motor is running and the selector switch is changed, the motor shall stop. Reversing any motor immediately can damage mechanical equipment. The design shall include protection logic through the use of a time delay. Ensure the design forces the operator to wait 7 seconds anytime the motor is **within the protection period AND a direction change is commanded**. Once the motor has been off for the duration of the protection period, it may be started in either direction immediately. Whenever the motor is running in the clockwise direction, the green light shall illuminate. Whenever the motor is running in the counter-clockwise direction, the blue light shall illuminate. A yellow light shall indicate to the operator that the motor has been commanded to stop and is within the protection time-delay period. Whenever the motor is not running, the red light shall illuminate. No two lights shall be on at the same time. You may either control a single-phase motor or a three-phase motor for this test. A motor will not be wired to the circuit. Logic will be tested with relays only. You **must** follow the following sequence;

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

After review, **then** you may get out **a computer assigned to you for the test**.

Compose your program and review with your instructor **before** getting your panel. \_\_\_\_

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

Failure to follow the above sequence shall result in a 10-25 point deduction depending on severity.

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