Title: **Fwd/Rev/Jog using 2 Pushbuttons & 2 SS for a 3P Motor** Job: 26

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

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

**Objectives**

1. Student shall reinforce their knowledge of a forward/reverse/jog motor control circuit.
2. Student shall develop a knowledge of counters, timers and math functions and their use.

**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.

**Devices**

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| Inputs | | |
| *Device* | *Description* | *Symbol* |
| NC Mushroom Head PB (ESTOP) | Emergency Stop | ESTOP |
| Three-position Selector Switch | Direction: Forward or Reverse | FWD, REV |
| Two-position Selector Switch | Mode: Run or Jog | RUN\_MODE |
| NC Pushbutton (PB1) | Stop Motor | STOP |
| NO Pushbutton (PB2) | Start Motor | START |
| NO Pushbutton (PB3) | Reset Start Counters | RESET |
| NO Contacts (MS-F-AUX) | Forward Motor Starter Status | MSF\_STAT |
| NO Contacts (MS-R-AUX) | Reverse Motor Starter Status | MSR\_STAT |
| NO Contacts (MS-OL) | Motor Overload Contacts | MS\_OL |
| Outputs | | |
| *Device* | *Description* | *Symbol* |
| Green Pilot Light | Motor Running Forward | FORWARD |
| Red Pilot Light | Motor Stopped | STOPPED |
| Yellow Pilot Light | Motor Overload | OVERLOAD |
| Blue Pilot Light | Motor Running Reverse | REVERSE |
| 24VDC Three-Phase Motor Starter | Forward Motor Contactor | MSF |
| 24VDC Three-Phase Motor Contactor | Reverse Motor Contactor | MSR |

**Instructions**

Design a forward/reverse/jog motor control circuit using the devices listed above. One pushbutton shall be used as a stop, another a start or jog. Whether the motor starts or merely jogs is determined by a two-position selector switch. If the two-position selector switch is in the A position, the motor shall start and if in the B position, the motor shall jog. 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 in the same direction, no time delay is required. Additionally, the program shall keep track of run hours in the forward direction and reverse direction. The timers shall be resettable using the remaining pushbutton. 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. Toggle switches shall be installed on contact inputs to simulate a field failure. Lights are defined as listed above. If the motor is in the direction change time period, the direction light (green or blue) shall flash while waiting. If the circuit times out on the lack of field confirmation, the red light shall flash.

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