Title: **Fwd-Rev using Three Pushbuttons for 1P Motor** Job: 18

Course: Intro to Automation Unit: Manual Motor Control CLO: 2

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

**Objectives**

1. Student shall identify how to change directional rotation of a single-phase motor.
2. Student shall define the function of start windings within a single-phase motor.
3. Student shall recognize the purpose for a start switch within a single-phase motor.

**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 Manual Motor Control rubric.

**Devices**

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| Inputs | | |
| *Device* | *Description* | *Symbol* |
| Normally Closed Pushbutton | Stop Motor | STOP |
| Dual Action Pushbutton | Start Forward | FWD |
| Normally Open Pushbutton | Start Reverse | REV |
| Outputs | | |
| *Device* | *Description* | *Symbol* |
| Green Pilot Light | Motor Running | RUNNING |
| Red Pilot Light | Motor Stopped | STOPPED |
| Blue Pilot Light | Reverse Indication | REVERSE |
| Eleven-Pin Relay | Direction Control | DIR |
| Eight-Pin Relay | Direction Control 2 | DIR2 |
| Eight-Pin Relay | Motor Control | CR5 |
| 120VAC Motor | Reversible ½HP AC Motor | M5 |

**Instructions**

Design a forward/reverse motor control circuit using the device listed above. One pushbutton shall be a “forward” button. When the forward button is pressed, the motor shall start and continue to run in a counter-clockwise (CCW) fashion even if the forward (FWD) button is no longer pressed. Another pushbutton shall be the reverse (REV) button. When the reverse button is pressed, the motor shall start and continue to run in a clockwise (CW) fashion even if the REV button is no longer pressed. The remaining pushbutton shall be a stop button. If the stop button is pressed, the motor shall stop running regardless on direction. While the motor is running, the green light shall illuminate, and the red light shall be off. If the motor is running forward, only the green light shall illuminate. If the motor is running in reverse, the green and blue lights shall illuminate. When the motor is not running, the green and blue lights shall be off, and the red light shall illuminate. HINT: The solution requires three control relays. Use the space on the opposite side of this page to design the circuit. Once complete, review the design with the instructor. After obtaining approval, wire the circuit ensuring to label all wires with the appropriate wire numbers. Have the instructor review all wiring before energizing the circuit. Render the schematic using a CAD type software package. Post the schematic to the *student share* folder using filename *MMC Job 18 – name.ext.*

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Discussed design \_\_\_\_\_\_\_\_ Checked wiring \_\_\_\_\_\_\_\_ Energized Test \_\_\_\_\_\_\_\_