Title: **Level Control** Job: 10

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

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

**Objectives**

1. Student shall design a motor control circuit for a single-phase pump.
2. Student shall develop process control design skills.
3. Student shall construct a basic level control scheme.

**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.

**Materials**

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| --- | --- | --- | --- | --- | --- |
| Inputs | | | Outputs | | |
| Q | Input Device | Function | Q | Input Device | Function |
| 1 | Mushroom head PB | ESTOP | 1 | Green Pilot Light | PUMPING |
| 0 | 3P selector switch |  | 0 | Yellow Pilot Light |  |
| 1 | 2P selector switch | OFF\_AUTO | 1 | Red Pilot Light | STOPPED |
| 0 | NC Pushbutton |  | 0 | Blue Pilot Light |  |
| 0 | Dual Pushbutton |  | 1 | Eight-pin relay | Pump Control |
| 1 | Level Switch | LEVEL | 0 | Eleven-pin relay |  |

**Instructions**

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| --- | --- |
| Design an automatic control scheme that shall control the level of water in a process tank. Using the input from a level switch, control a pump at the bottom of the tank to expel the water from the tank. The circuit can be turned on or off through the use of a selector switch. The entire control scheme shall be protected by an ESTOP. Use the components listed above to design the circuit. Whenever the motor is running, the green light shall illuminate, and the red light shall be off. When the motor is not running, the green light shall be off, and the red light shall illuminate. The pump control relay shall be connected to both DC, for control signals, and AC, to start/stop the pump. Ensure that all voltages are separated. 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. Ensure 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 10 –name.ext.* |  |

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