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| **Course Name:** | **Virtual Instrumentation and Automation lab** | **Semester:** | **V** |
| **Date of Performance:** | **05/11/2021** | **Batch No:** | **B1** |
| **Faculty Name:** | **Prof. AA** | **Roll No:** | **1912052** |
| **Faculty Sign & Date:** |  | **Grade/Marks:** |  |

**Experiment No: 9**

**Title: Study of Hydraulic Kit**

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| **Aim and Objective of the Experiment:** |
| Implement a hydraulic system using hydraulic kit with 4/2 DCV |

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| **COs to be achieved:** |
| CO4: Hydraulic and Pneumatic understanding |

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| **Components Used in the experiment :**    The below shown diagram is the setup of the hydraulic kit described in the video –    Components used in the hydraulic kit are –   1. **4/2 Manual Hydraulic DCV**     Four ports and two spool locations make up a 4/2 directional control valve. The working fluid from the actuator was returned to the valve, which was then repressurized. A is for actuator. For the actuator's action, a working fluid is passed through the valve. A 4/2 valve is a four-way, two-position valve. These valves are commonly used in double-acting cylinder applications, where one side of the cylinder is always under pressure while the other is vented to the atmosphere. A 4-way valve is required for a double-acting actuator. A 4-way valve interdependently pressurises and exhausts two openings. A three-position, four-way valve can either halt or let an actuator float.   1. **Hydraulic Gear type motor**     Hydraulic motors are divided into three categories: gear, piston, and vane. Gear motors are small and efficient, providing continuous service at rated power levels. They have a high tolerance for hydraulic oil contamination, which is important for applications in filthy locations. Hydraulic motors are divided into two categories: high speed, low torque (HSLT) and low speed, high torque (LSHT) (LSHT). The gerotor/geroller or orbital and external spur gear designs are the two types of gear motors. Hydraulic fluid causes the gears to revolve when it is pumped into the motor.   1. **4/3 Hydraulic DCV**     Pressure (P), Tank (T), Advance (A), and Retract (R) are the four ports on a four-way valve (B). The three locations are used to control the tool or cylinder's advance, retract, and hold. Double-acting hydraulic tools and cylinders are controlled by 4-way valves. A directional control valve with four ports and three positions, or flow channels, is represented by the 4-Way Directional Valve block. Depending on the working side of the actuator, fluid can flow from the pump to the actuator via path P-A or P-B, and from the actuator to the tank via either A-T or B-T.   1. **DAHC**     A double-acting cylinder is one in which the working fluid operates on both sides of the piston alternately. A port at each end of a double-acting hydraulic cylinder is supplied with hydraulic fluid for both the retraction and extension of the piston. Instead of delivering pressurised air through a single port, double acting cylinders contain two ports through which air can flow in and out. Air enters one port, propelling the piston forward, while pressurised air is applied to the other port, pulling the piston back into the cylinder..   1. **DAC with end pistons**     Double rod-end cylinders can move two loads at the same time and eliminate the difference in area between the rod and blank sides of the piston. A given flow gives the same extension and retraction speeds on both sides of the piston with equal areas (and cylinder volumes).   1. **PLC**     A PLC is a digital electronic device made up of hardware and software components that interface with input devices like pushbuttons and sensors as well as output devices like motors and solenoid valves in a machine to perform the desired control task.   1. **Flow control valve**     Within a pneumatic system, a flow control valve modifies and controls the volume flow of air. They're frequently utilised to change the speed at which an actuator operates. They are not to be confused with pressure regulators or pressure controllers. |

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| **Conclusion:**   * In this experiment we have studied the components of a hydraulic kit and how the components work, implemented a system with the PLC and the experiment was completed successfully. |

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| **Signature of faculty in-charge with Date:** |