

**A REPORT  
ON  
DESIGN AND OPERATION OF THE DEMO SYSTEM FOR AIR  
COMPRESSOR CONTROL SYSTEM WITH HIGH PRESSURE  
SWITCH INTERLOCK**

**BY**

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**2016CSE127  
2016CSE148  
2016ECE021  
2016CSE091**

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**AT  
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**Professional Practice Centre of**



**PRESIDENCY UNIVERSITY, BENGALURU**

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**Mr. Vinay Avanchi**

**Mr. Sukumaran Mathoor**

**Mr.P.S. Krishna**

**Dr. BV Prabhu**

**Mr. Badarinath. S.N**

**Dr. Sangeetha Anand**

Last but not the least, I am grateful to our parents who constantly inspire us and support us in every step I take.

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# PRESIDENCY UNIVERSITY, BENGALURU

## Professional Practice Program

**Centre:** INDUSTRICONNECT TECHNOLOGIES PRIVATE LIMITED  
**Duration :** 2 months  
**Date of start:** 28th May 2018  
**Date of Submission:** 20th July 2018  
**Title of the project:** DEMO UNIT FOR AIR COMPRESSOR CONTROL SYSTEM WITH HIGH PRESSURE SWITCH INTERLOCK  
**Id No.:** 2016CSE148,2016CSE127,2016CSE091,2016ECE021  
**Name:** Sanjana Poonia, Divya Prasad, Keerthana J, Bharath  
**Branch of the students:** B.Tech computer science, Electronics and Communication engineering

**Name and designation of the experts:** Mr. Vinay Avanchi, Founder and Director  
Mr. Krishna P.S., Principal Consultant  
**Name of the PP faculty:** Dr. Sangeetha Anand  
**Keywords:** Semi Automation, Simulation process using PLC kit  
**Project Area:** PISD

**Abstract:** Our project is demo unit for air compressor control system and is based on the principle of air compression. In these we use many equipment & tools for distribution of compressed air. The equipment is like pressure switch, isolation gate valve, solenoid valve, pressure gauge, air accumulator...etc., having their own purpose to provide compressed air with semi automation technology for customers. It works on the principle of air compression, as it takes an air from atmosphere and compresses and stores in accumulator and supplies the required air for customers

Signature of the student:

Signature of the PP faculty:

Date: 20th July 2018

Date: 20th July 2018

## **INTRODUCTION**

### **About the Company – coverage**

IndustriConnect Technologies Private Limited Company was founded by Mr. Vinay Avanchion 5<sup>th</sup> December 2016. The primary aim of the company is to bridge the gap between academia and industry by providing value-based training to students studying in Engineering colleges and those who have completed their Engineering course and searching for jobs. The training is intended to make the students industry ready and employable. The curriculum includes case studies from real life projects followed by hands on exposure on Automation equipment and IIoT devices. This will help us understand professional industry practices followed in Design & Engineering, Installation, Testing and Commissioning for the management of real life Industrial projects. Courses will also be suitable for fresh industry professionals who would like to enhance their skills and also college faculty to get connected with the industry.

### **ABOUT THE DEPARTMENT OF WORK**

The primary aim of the work to be carried out in the department is to understand the concepts of how a real life Industrial Automation EPCC (Engineering, Procurement, Construction and Commissioning) project is executed in industries. For this, a first project work involving the real-life case study of envisaging a complete Automation system for an air compressor system was assigned to us.

Our project involves the demonstration of automating an air compressor system through PLC (Programmable Logic Control System) and field instrumentation devices to provide continuous monitoring, control and high-pressure switch interlock system for the safe and smooth operation of the air compressor.

Our project is based on the principle of air compression by means of an air compressor. The various activities in the project involved: Design & Engineering, Procurement, Construction and Commissioning of the air compressor system as explained in the P&ID given below.

It has interlock system with a proper logic designed to avoid accidents and any other issues which leads to loss. The interlock system was designed based on ladder diagram and programmed by using the software WPL. The HMI screens were developed by utilizing the software DOP.

It works under different temperature and pressure ranges and suitable for industrial purposes.

## **PROBLEM SOLVING / PROJECT METHODOLOGY**

### **PROBLEM DEFINITION:**

SIMULATION OF AIR COMPRESSOR USING PLC

GATHERING OF INFORMATION

DESIGNING and P&I diagrams

CONCEPTS OF AIR COMPRESSOR

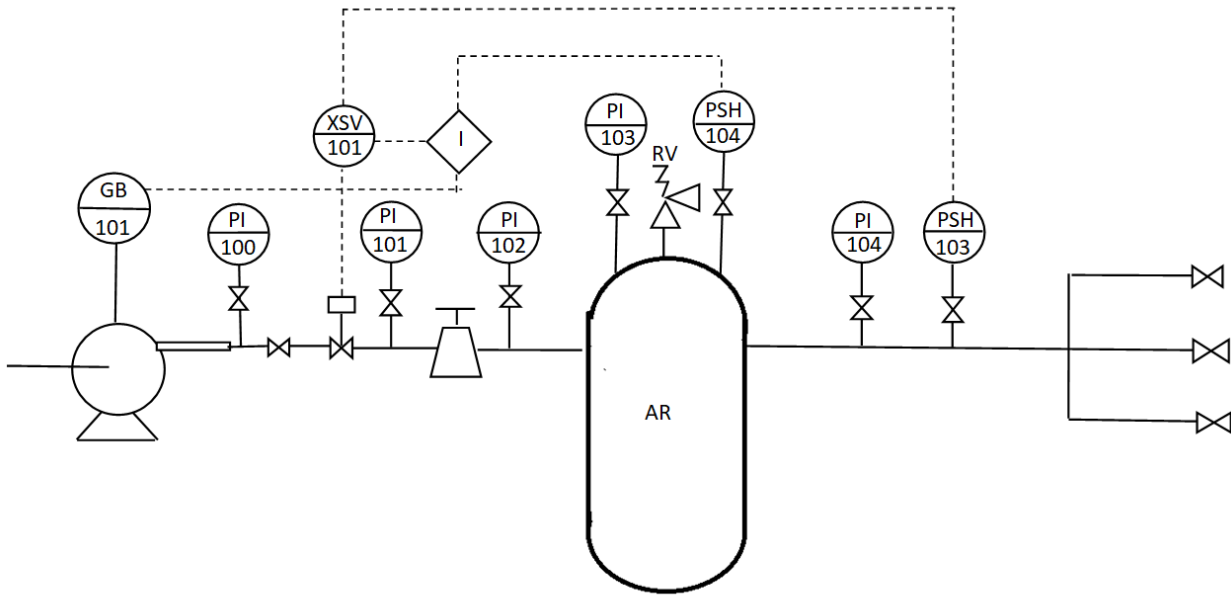
TESTING

COMMISSIONING

CONSTR

The main principle behind this is to understand the principles of 'CONCEPT TO COMMISSIONING'.

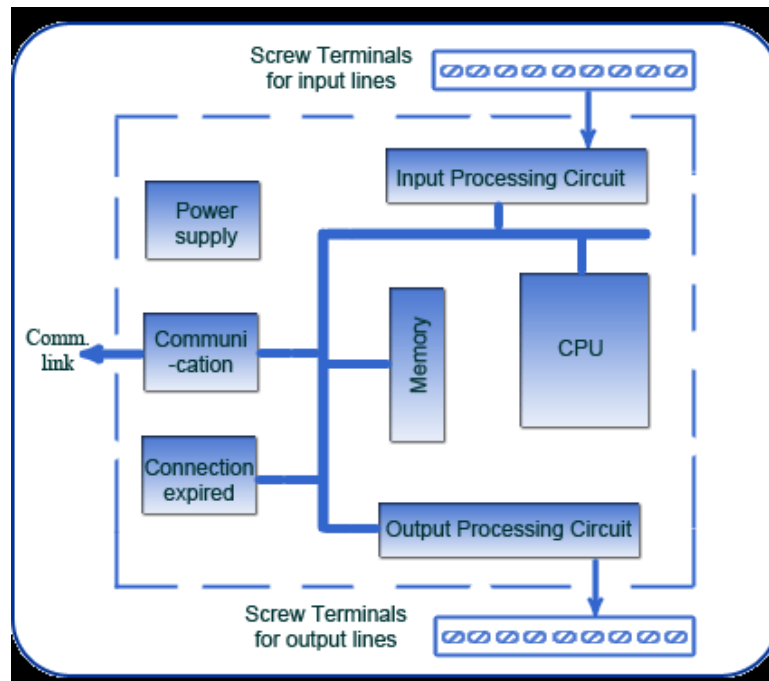
- Referred through different websites, different equipment, different manufacturers, and how does it work
- Referred through different researches and collected different details and constructed P&I diagram
- Simulation is a process of working of any device by plc kit or loop testing
- After collecting the details, then it goes to construction part. after construction it goes to testing part
- Real testing of device by PLC
- We have finalized based on specifications



P&I diagram

### PLC Hardware

The hardware components of a PLC system are CPU, Memory, Input/output, Power supply unit, and programming device. Below is a diagram of the system overview of PLC.



# I/O LIST

SNO	TAG REF	ANALOG INPUT	ANALOG OUTPUT	DIGITAL INPUT	DIGITAL OUTPUT
1.	PSH 103	-	-	PSH 103 – PLC	-
2.	PSH 104	-	-	PSH 104 – PLC	-
3.	XSV 101	-	-	-	PLC – XSV 101
4.	CFC 101	-	-	MONITOR CONTROL CENTER - PLC	PLC – MONITOR CONTROL CENTER
5.	START P/B	-	-	PB – PLC	-
6.	STOP P/B	-	-	PB – PLC	-
7.	GREEN LAMP	-	-	-	PLC – LMP
8.	RED LAMP	-	-	-	PLC – LMP

## Ladder diagram

