The requirement specification

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# Introduction

In these project studies we practice making an order and producing working application for the group ordering from us.

We are a company that specifies in high quality painting work for industrial appliances. Reliable tools are a crucial part when delivering the best possible product to our customers. Applying special paints is a subtle process and we need a trustworthy supplier to work with this issue.

# Background

* 1. Reason for acquisition

Our company needs an air compressor which can keep the pressure steady. In painting we can’t have an unsteady pressure because it can lead to imperfections in the finish.

* 1. Main objectives and benefits

We can save time and money when we get the desired result on the first try. The objective is to keep the pressure as steady as possible while avoiding spikes in the pressure.

# Functional requirements

The pressure must stay close to 10 bar and can only deviate from 9,5 bar to 10,0 bar.

* 1. Startup

The system is started by an operator pressing the H-100 button. The PC-100 air compressor starts to pressure the tank until it reaches the setpoint of 10 bar.

* 1. Normal operation

The pressure is continuously monitored by the PI-100 pressure sensor. PC-100 is turned on gradually as the pressure starts going down. The ON status of PC-100 is indicated by OI-100.1 and the OFF status is indicated by OI-100.2.

The PC-100 can only be turned on if the pressure release valve status is CLOSED (GI-100.2 is ON) and the airflow restriction valve status is OPEN (GI-100.3 is ON). If the pressure release valve status is OPEN (GI-100.1) or both valves are closed (GI-100.2 and GI-100.4 are ON), the PC-100 must be turned off.

* 1. Emergency

A broken component may cause the tank to get pressurized too much. Too high level of pressure is unsafe for the workers and equipment. If the pressure reaches 10,2 bar the OI-100.3 LED is flashed at 5Hz rate.

After reaching 10,5 bar or if the emergency stop button H-100.3 is pressed:

* PEZ-100.1 emergency release valve is opened, and the opening is confirmed by OI-100.4 light.
* PEZ-100.2 airflow restriction valve is closed, and the closing is confirmed by OI-100.5 light.
* PC-100 air compressor is shut off
* OI-100.3 is flashed at 1Hz rate

if the 10,5 bar is reached, the system can only be started normally after the emergency has been cleared and confirmed by pressing the H-100.4 emergency reset button.

* 1. Maintenance

The pressure tank can be emptied by pressing the H-100.5 button. Pressure indicator light OI-100.6 is ON when the pressure reaches 0.

# Hardware description

PC-100 Air compressor

PI-100 Pressure sensor Sensing the air tank pressure

PEZ-100.1 Pressure release valve Emptying air tank in emergency or emptying

PEZ-100.2 Airflow restriction valve Closing when emergency or emptying is on

OI-100.1 LED On when air compressor on

OI-100.2 LED On when air compressor off

OI-100.3 LED On when pressure alarm on

OI-100.4 LED On when pressure release valve open

OI-100.5 LED On when airflow restriction valve closed

OI-100.6 LED On when pressure tank emptying

H-100.1 Button System start button

H-100.2 Button System stop button

H-100.3 Button Emergency stop button

H-100.4 Button Emergency reset button

H-100.5 Button Pressure tank emptying button

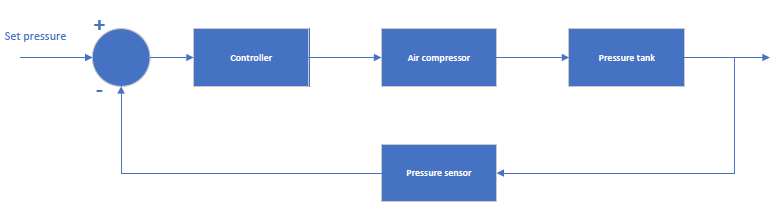
GI-100.1 Sensor Pressure release valve open

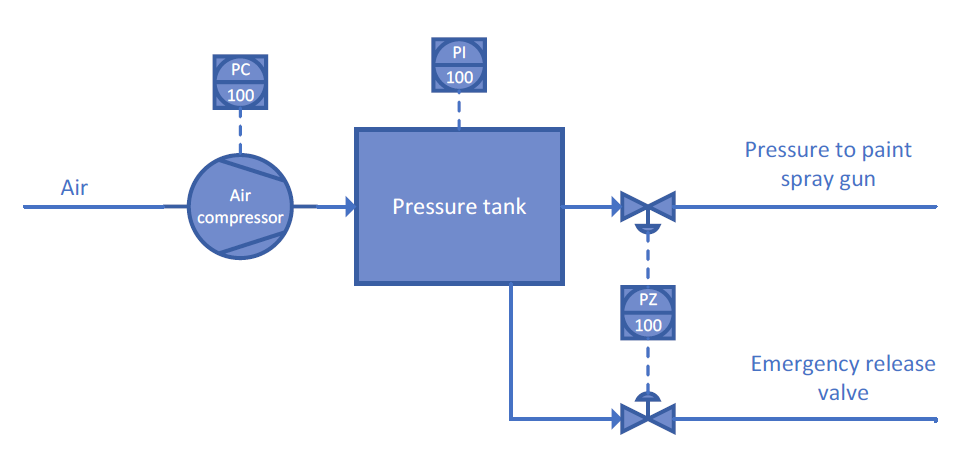
GI-100.2 Sensor Pressure release valve closed

GI-100.3 Sensor Airflow restriction valve open

GI-100.4 Sensor Airflow restriction valve closed

# Appendixes





Kuva, joka sisältää kohteen pöytä

Kuvaus luotu automaattisesti