

# Diploma Project

- ▶ Theme: System of automatic control of gas pressure in the tanks
- ▶ Supervisor: Japparkulov Bakhyt
  - ▶ Student: Zhuranov Turlybek

# Outline:

Aim of diploma project

Introduction

Pressure control in oil and gas industry

Examples of pressure values

Process Line Panel for pressure control

Realization of PID algorithm

Development of automation system for  
air compressor

Conclusion

# Goal of the diploma project



# Introduction

- ▶ What is a process control?
- ▶ What is the automation?
- ▶ What is the pressure?

# ▶ Pressure regulator in oil and gas industry



## ► Examples of pressure values

Example	Pressure (bar)
Vacuum	$1,33 \cdot 10^{-12}$
Car tire	1,5 – 2,4
Water pipes	2,5 – 7,5
Minimum pressure level at gas distribution stations	12
Maximum pressure level in gas pipelines	118

# Process Line Panel for pressure control

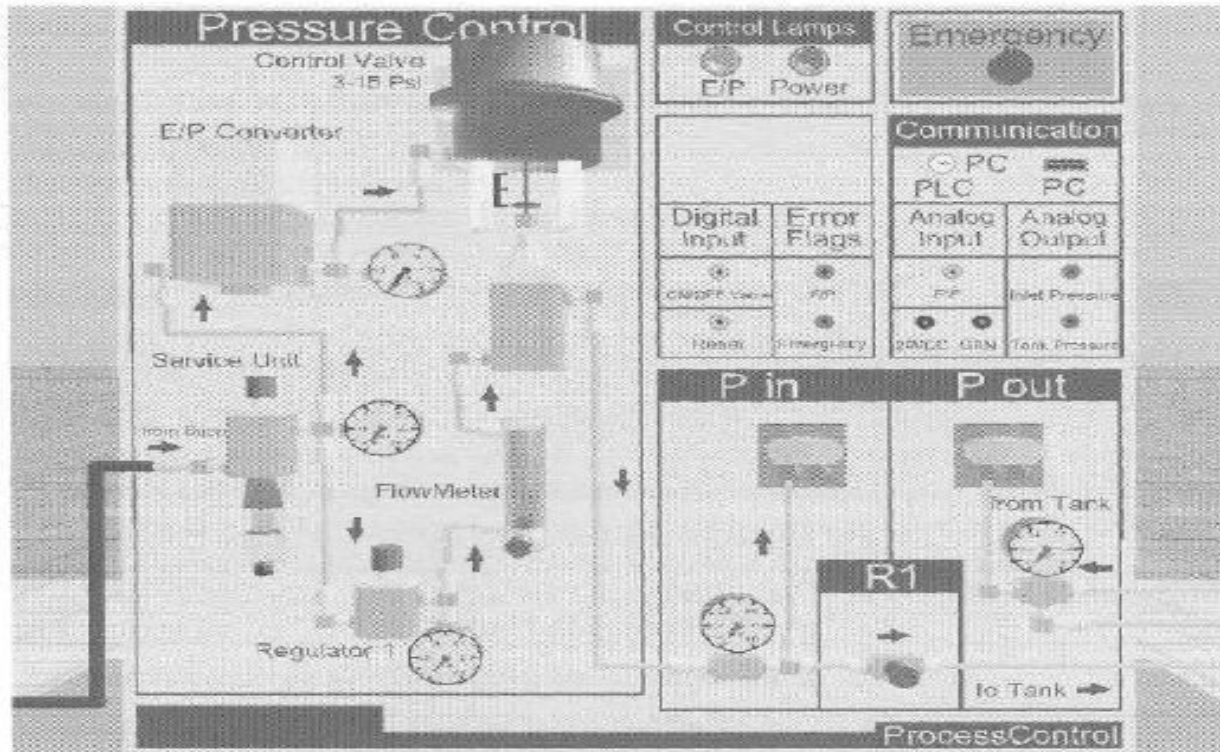
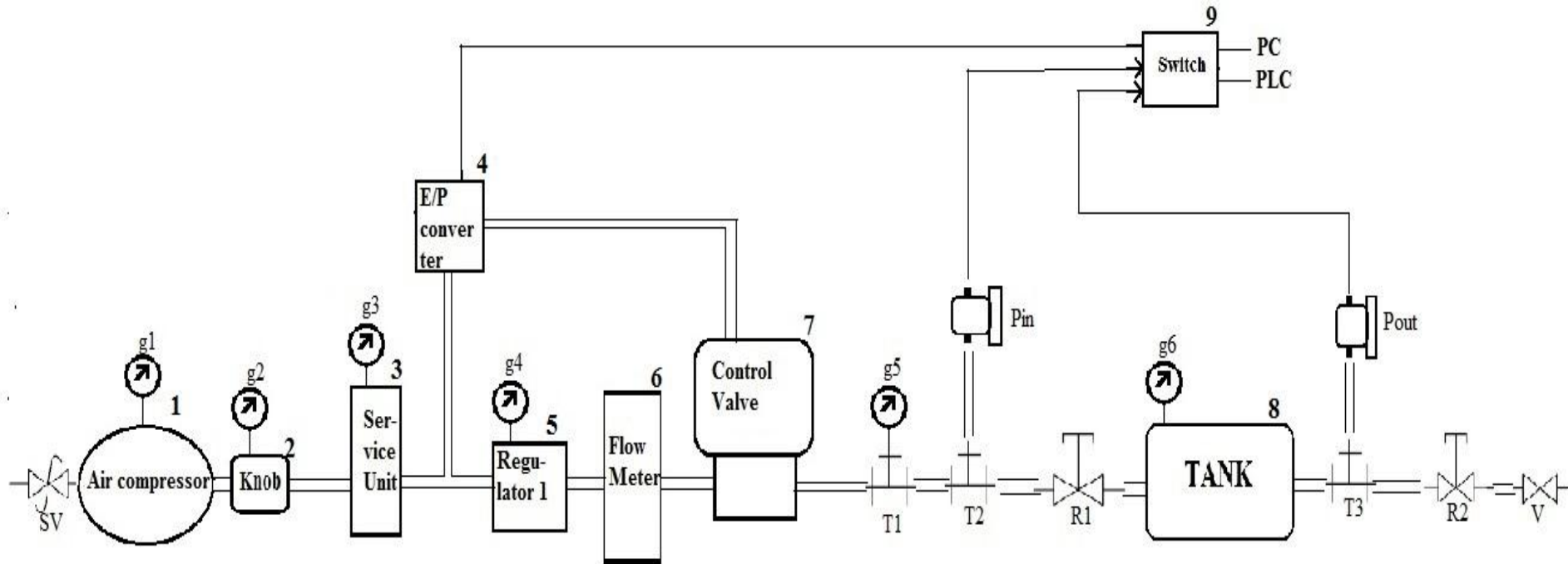


Figure 1-2: ProcessLine panel

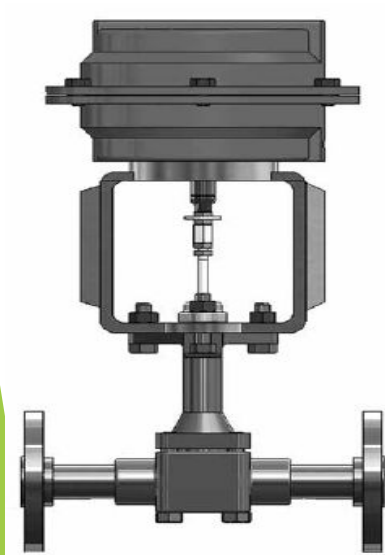
# Functional scheme of Process Line Panel





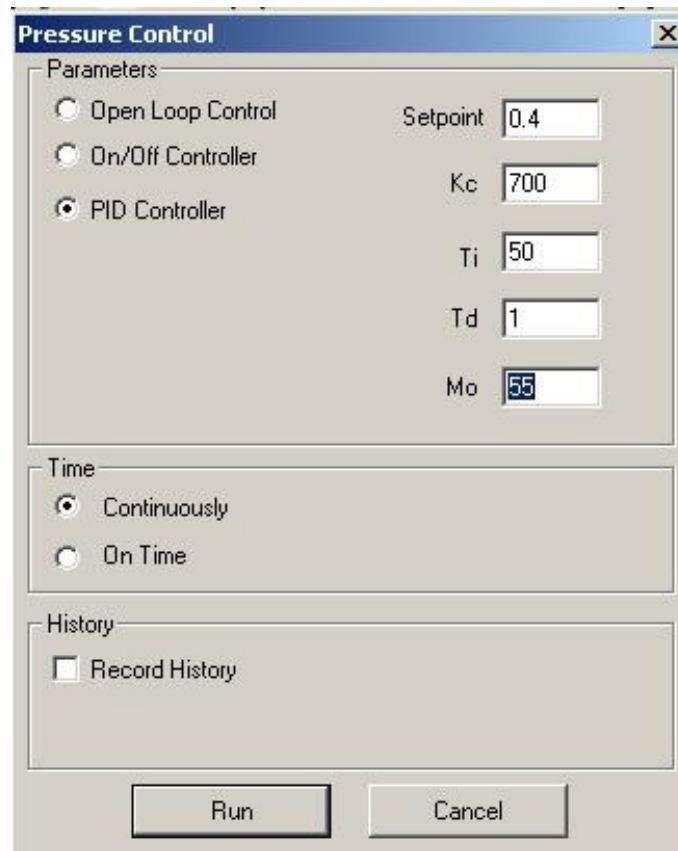
5. SPECIFICATION TABLE

No	Name	Mark	Parameter	Sybol	Aount
1	Air compressor	Compressor. Power plus. Silent operation. Model: POW547 Serial number: 2003-2717-001412	230V, 50Hz Max. pressure: 7.0bar/100Psi	-	1
2	Knob	Knob	Max. pressure 100 Psi	-	1
3	Service Unit	Regulator. <u>Camozzi</u> . N208-00.	In. P. max. 16bar. Out P. 0.5-10bar. T. max. 60 C	-	1
4	E/P converter	Transducer. <u>ControlAirInc</u> . AmherST, NH. Type 500x. I/P transducer	Input: 4-20mA. Output: 3-15Psi. Supply: 18-100Psi		1
5	Regulator 1	Regulator. <u>Camozzi</u> . M008-R00	In. P. max. 16bar. Out P. 0.5-10bar. T. max. 60	-	1
6	Flow Meter	Flow Meter	Range: 0-1000	-	1
7	Control Valve	Jordan Valve, OH. 45209. Model: 708. Serial: 1035548A	Size: ¼. Range: 15Psi. Max. T. 500	-	1
8	Tank	<u>Assouline</u> Compressors ltd, 7		-	1



# Running control system

## Choosing algorithm



The image shows a software dialog box titled "Pressure Control" with a close button (X) in the top right corner. The dialog is divided into three main sections: Parameters, Time, and History. At the bottom, there are "Run" and "Cancel" buttons.

**Parameters**

- Open Loop Control
- On/Off Controller
- PID Controller

Setpoint:

Kc:

Ti:

Td:

Mo:

**Time**

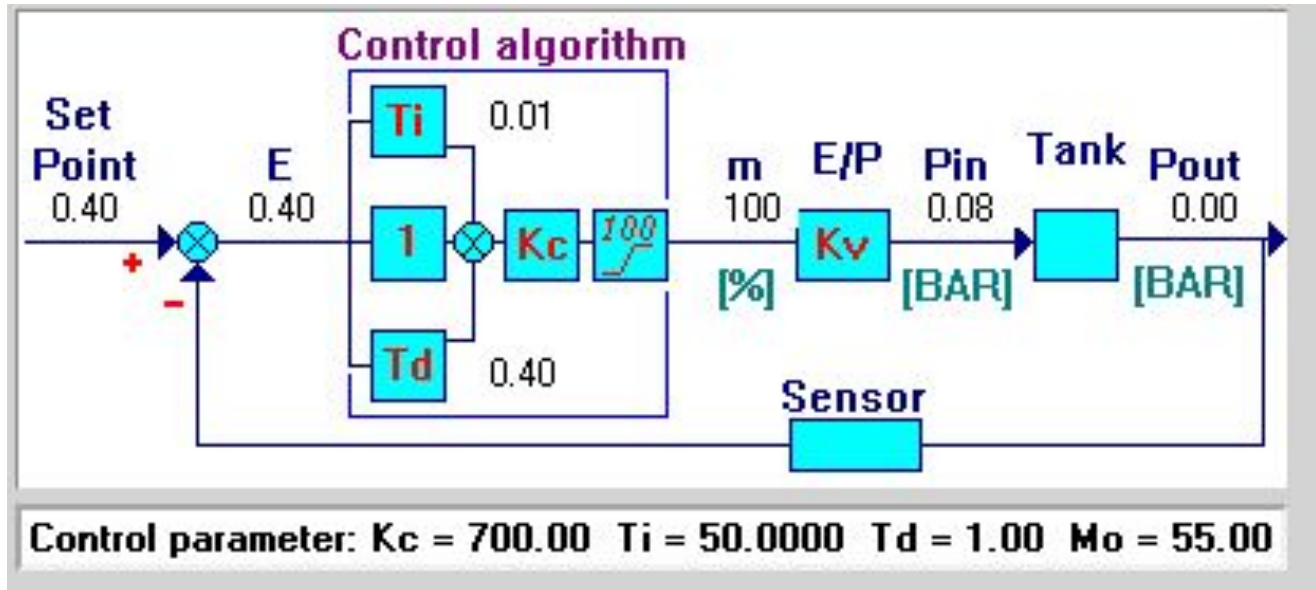
- Continuously
- On Time

**History**

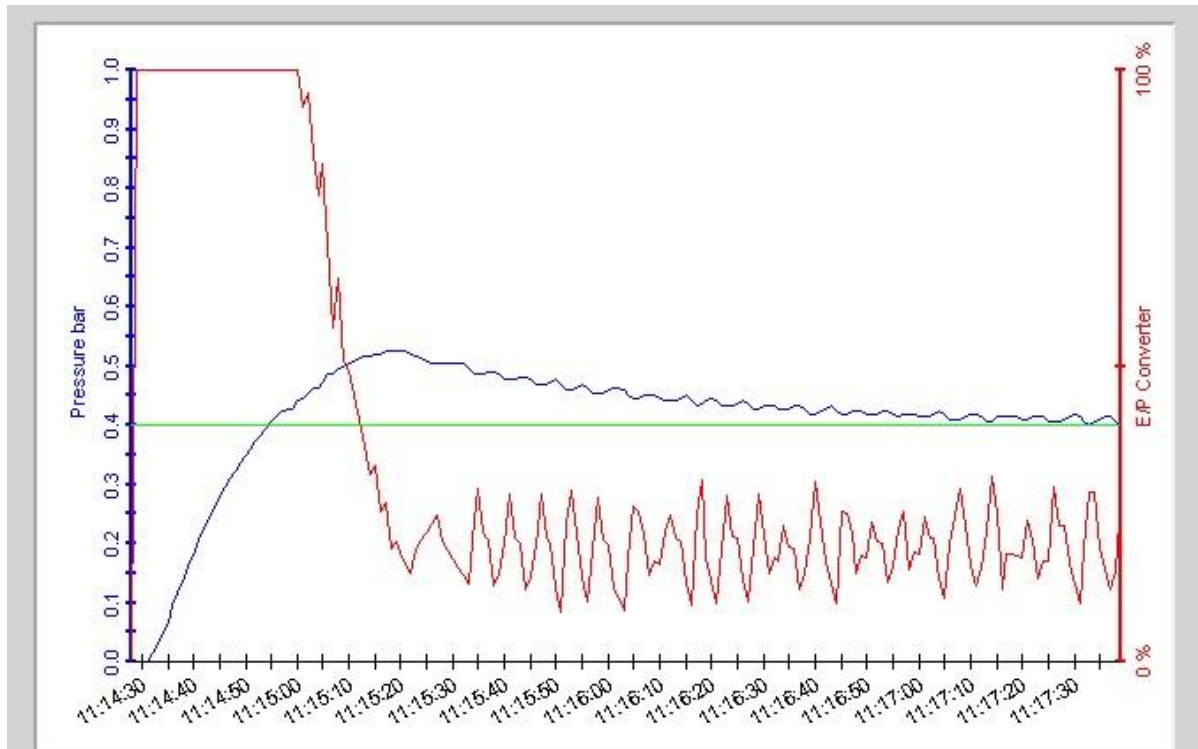
- Record History

Run Cancel

# Block diagram of the system

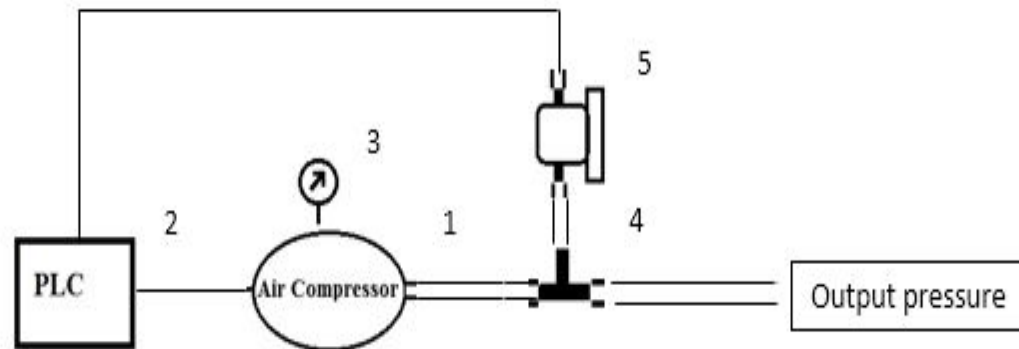


# Diagram of output pressure



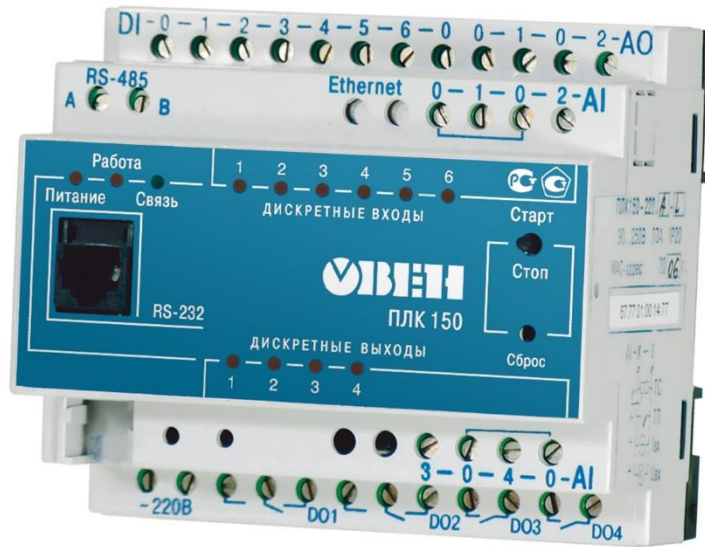
# Development of automation system for air compressor

The scheme of controlling the output pressure of air compressor from 2 to 3 bar





# Controller Oven PLC 150, for air compressor



# Pressure sensor, Jumo Midas





# Conclusion

- ▶ In conclusion, during the working period on diploma project were done a lot of works and obtained new skills and knowledge that they will be helpful in the future.

**THANK YOU FOR YOUR  
ATTENTION**

The slide features a white background with a decorative graphic on the right side. This graphic consists of several overlapping, semi-transparent green shapes in various shades, ranging from light lime green to dark forest green. These shapes are primarily triangular and polygonal, creating a modern, abstract design. A thin, light gray line also runs diagonally across the lower right portion of the slide, intersecting the green shapes.

# Reference list:

- ▶ <http://fas.su/page-542>
- ▶ <http://www.lesman.com/unleashd/catalog/valves/Lowflow-Mark708/Lowflow-Mark-708-ds-MK708-0713-2K.pdf>
- ▶ [http://www.camozzi-usa.com/sites/default/files/product\\_branch/usaproduct/en-us-in-line-flow-control-valves-series-rfu/series-rfu.pdf](http://www.camozzi-usa.com/sites/default/files/product_branch/usaproduct/en-us-in-line-flow-control-valves-series-rfu/series-rfu.pdf)
- ▶ [http://www.controlair.com/downloads/500\\_spec.pdf](http://www.controlair.com/downloads/500_spec.pdf)