Project - Humidifier

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Summary

The goal is to develop a humidifier with a Web interface for a server room of 80 m³.

The final product must:

- maintain of a relative humidity between 40 % and 70 % (+- 5);
- distribute the generation of water vapour within the room;
- have two days of autonomy;
- be placed on the floor of the room;

Summary

- include water and humidity alarms;
- have on-off switch;
- be compliant with the EU Directives 2006/42/CE 2006-05-17 and 2006/95/CE 2006-12-12;
- have a composite material structure to hold the control unit and the water container;
- include a life-cycle analysis;
- use open source technologies

Problem

- Low humidity: Electrostatic discharge

Objectives

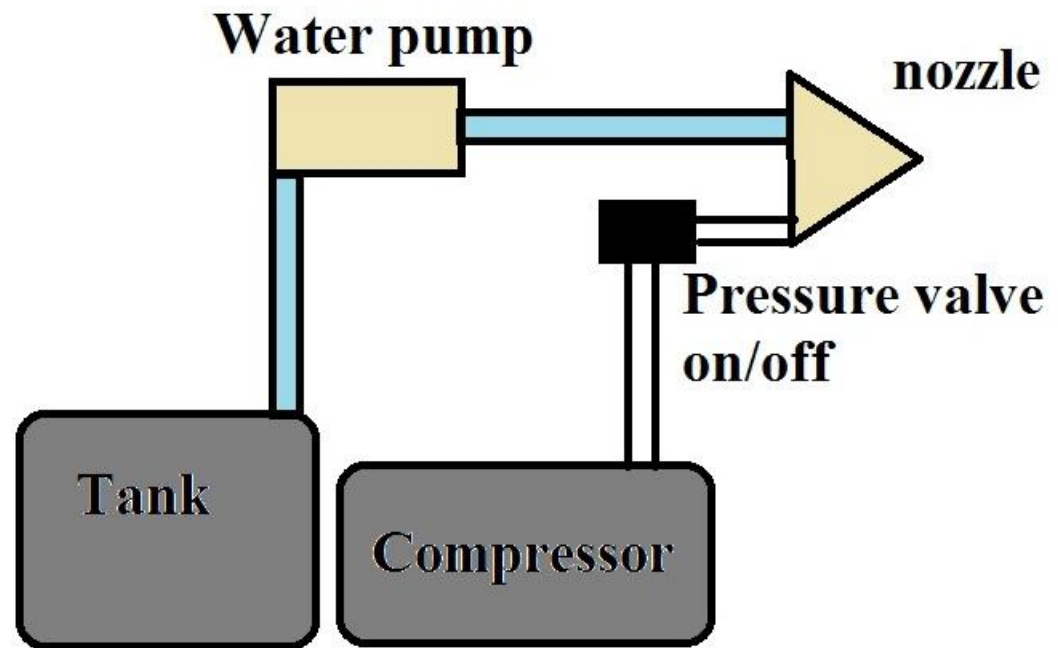- Make humidifier

- Team work

- Improve english skills

- Type of humidifier:
  - Steam
  - Fan
  - High water pressure
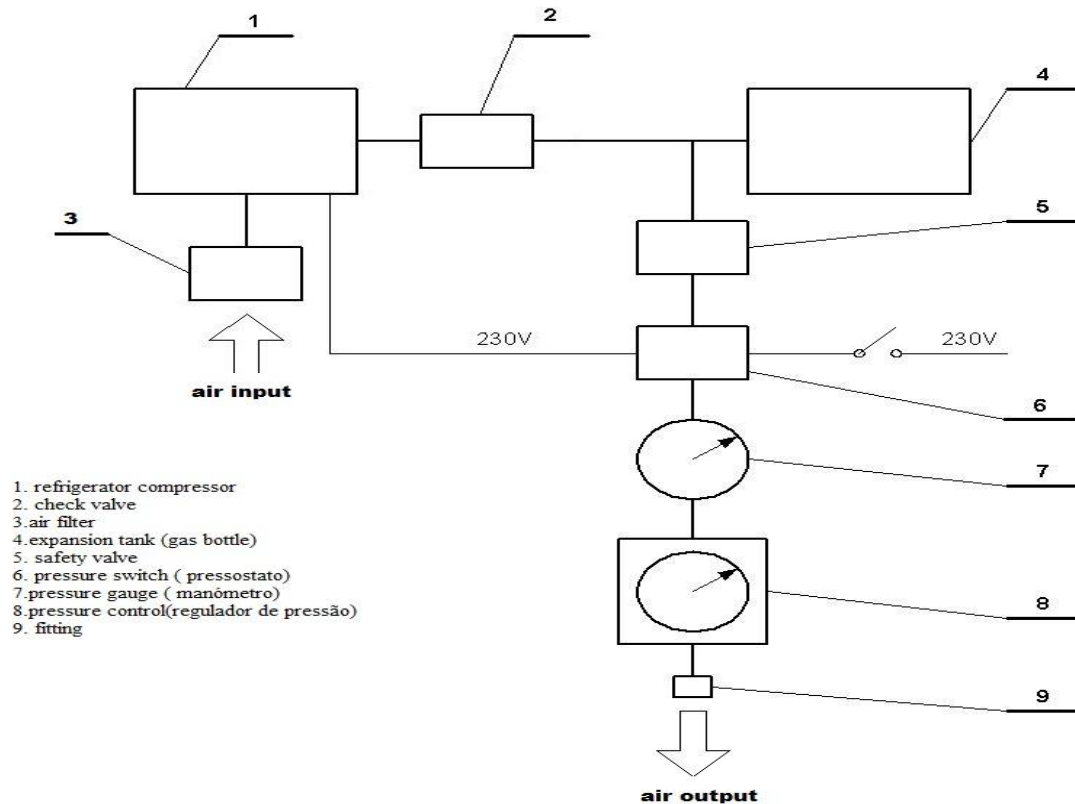 - Ultrasound method
  - Compressed air

Advantage of our humidifier:

- Good performance

- Cold vapor

- Quite easy control

State of the Art - Humidifier

- Previous compressor solution

1. refrigerator compressor
2. check valve
3. air filter
4. expansion tank (gas bottle)
5. safety valve
6. pressure switch (pressostato)
7. pressure gauge (manómetro)
8. pressure control(regulador de pressão)
9. fitting

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State of the Art - Control

This fase we found two differents options:

Typical PLCs

PLC-(Programmable Logic Control)

Microcontroller with Arduino

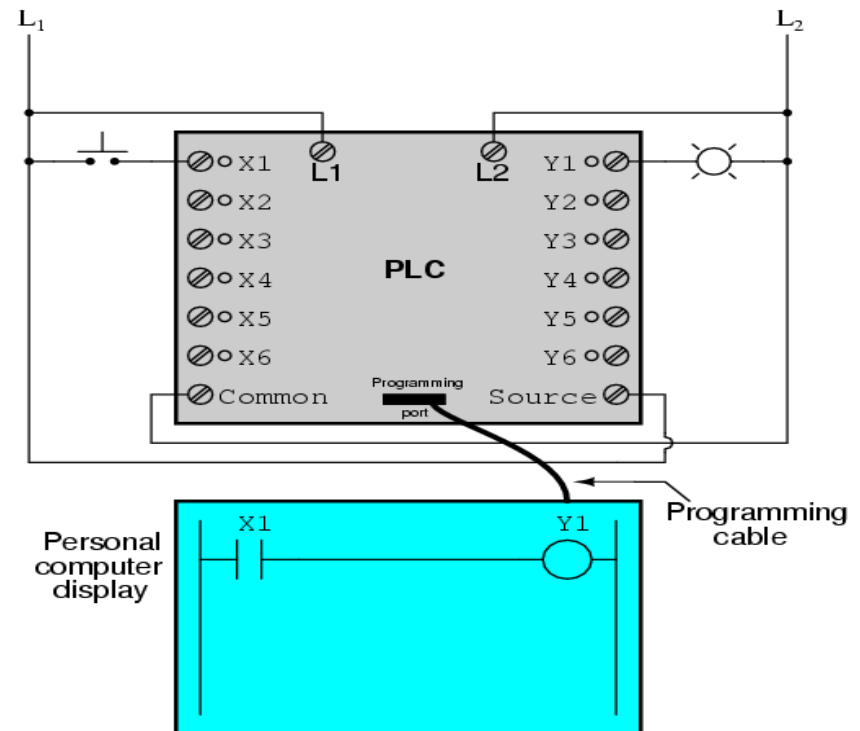Arduino/Ethernet/DHCP/Pachube basic tutorial
http://community.pachube.com/arduino/ethernet/watchdog

The ethernet shield will crash if the RESET pin is not hooked up (to something). In the above hardware configuration the RESET pin of the shield is hooked up to Digital (9) as an output. It goes to LOW to reset the shield then back to HIGH before every ethernet connection it makes.

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State of the Art - PLC (Programmable Logic Control)
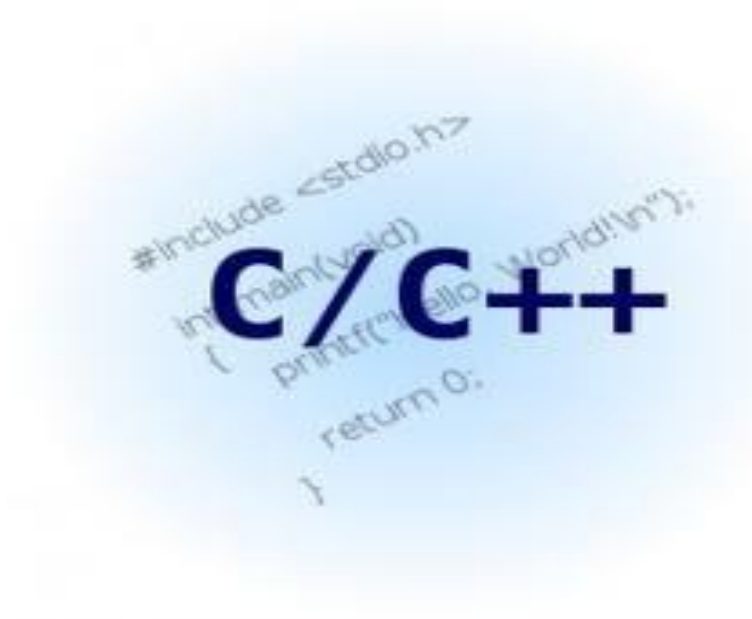
Applications and features

- Large industrial applications

- More durability

- More expensive

- Programming in Ladder
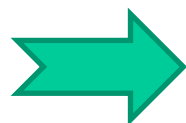
State of the Art – Microcontroller - Arduino

Applications and features

- Small applications

- Shorter life

- Cheaper

- Programming in C/C++

State of the Art – PLC vs Microcontroller

Features	PLC	Microcontroller
Life	5	3
Price	2	5
Programming	4	3
Similar Aplications	2	5
Total	13	16

Microcontroller

State of the Art – Web Interface

Features:

- Identify the sensors

- Life-cycle analysis

- Control humidifier

Programming language:

Java

State of the Art – Web Interface

Software:

Notepad++

TomCat

MySQL

Web Interface

First program in Java

```java
import javax.servlet.http.*;
import javax.servlet.*;
import java.io.*;

public class test extends HttpServlet {

    public void doGet(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, java.io.IOException {
            response.setContentType("text/html");
            PrintWriter out = response.getWriter();
            System.out.println("\nTeste de Escrita ");
            out.println("<html>\n<head>\n<title>Group 2</title>");
            out.println("\n</head>\n<body><h1>Hello<br>Group 2<br>");
            out.println("This is our first servlet;)</h1>\n</body>\n</html>");

    }

}
```
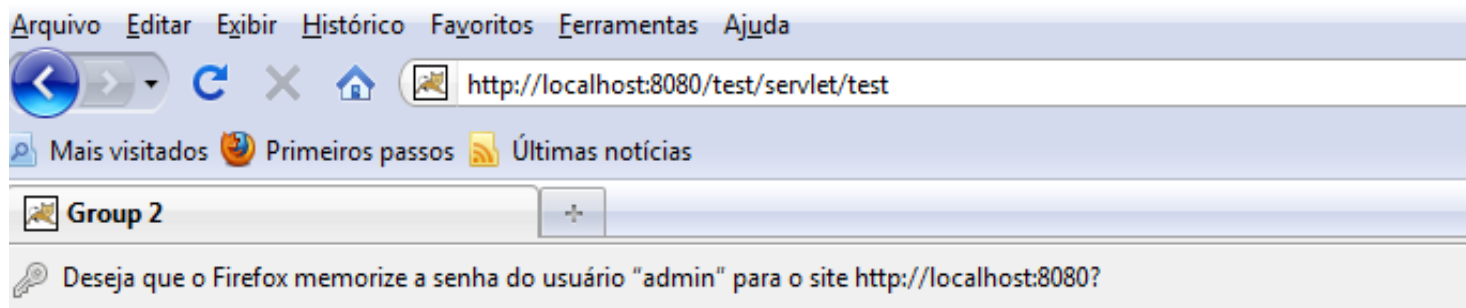
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First Servlet
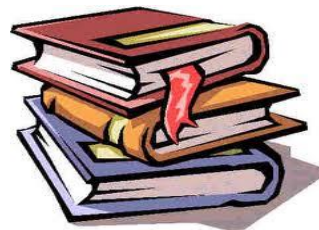
Conclusions

- **Achievements:**
    - We learned to work better in team
    - Improve communication
    - Apply our knowledge in real life situations

- **Future Developments:**
    - Buy the necessary materials
    - Test these decisions with laboratory equipment
    - Start to built each part of the humidifier
    - Interconnection the parts

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References & Bibliography

- http://arduino.cc/en/Main/arduinoBoardUno

- http://www.webtronico.com/produtos/view/163

- http://en.wikipedia.org/wiki/Programmable_logic_controlle

- http://www.java.com/en/download/faq/whatis_java.xml

- http://www.xtec.cat/formaciotic/dvdformacio/materials/tpnte/practica_4.html

Thanks for your attention

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