PHASE 1 INSTRUMENTS

Project Write-up

Name:……Group……
……

Module Title: Process Control Module No: I-10

Project Description: Electronic Controllers PC2A Project No:

Objective Nos: 4, 5, 13

PROJECT WRITE UP SHEET

Principle/Theory of Operation

In the early days of process control, what was the successful operation of a plant due to?

Give one example of an open loop control?

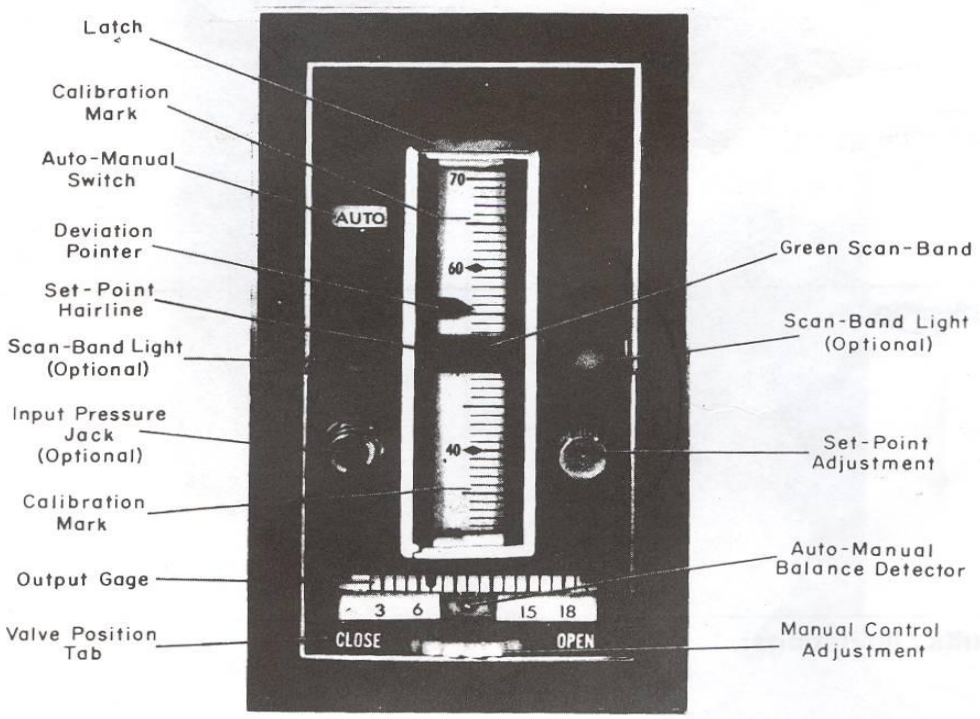
What do controllers have the facility to indicate?

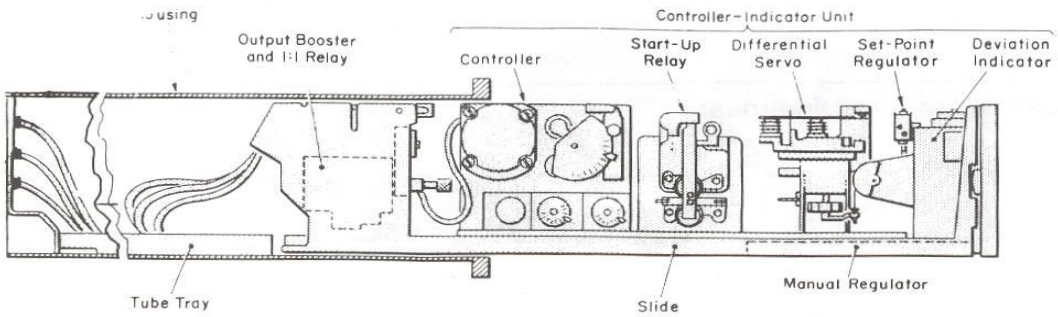
PROJECT WRITE UP

Module I-10 Process Control

Name:……
…..

Module Title: Process Control
Project Description: Pneumatic Controllers
Objective Nos: 4, 5, 9
Project No: PC 2B





PROJECT WRITE UP SHEET

Principle/Theory of Operation

Write down the Ziegler Nichols method of loop tuning.

If a controller with P and I was required, what would the I.A.T value be set to?

PROJECT SHEET

Module I-10 Process Control

Project Description: Electronic and Pneumatic Controller

ELECTRONIC	**Principle/Theory of Operation :** The electronic controller works in a similar fashion to the pneumatic controller except that it can be more sophisticated and everything is done electronically. The measured value is converted into digital signal and functions are then performed depending on the setup of the controller. Integral action and derivative action are added as required. Because the system is software driven, the system is a lot more flexible and quicker. A lot more functions can be performed such as automatic loop tuning and bumpless transfer.
PNEUMATIC	**Principle/Theory of Operation :** The pneumatic controller is used to control the operation of a control loop automatically. The measured variable, set point value, integral and derivative values are connected to an arrangement of bellows that measures, compares and computes the correct output to a control device depending on the setup of the actions. Depending on the application the controller can either have PB, P+I or PID control. The integral and derivative actions are set by altering small variable restrictors that allow air into the respective bellows. A small flapper nozzle arrangement on the top of the bellows assembly produces an output that is then volume boosted to drive the control device.

SUPPLEMENTARY QUESTIONS
Module I-10 Process Control

The successful completion of these questions provides the additional competencies required for Module I-10

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1. What are the benefits/advantages of process control?

2. Draw and briefly explain the basis elements of:

    a. An open loop system

    b. A closed loop system

3. What is a controller as defined by B.S. 1523 ?

4. A controller can operate in either _____ or _____ mode.

   In the _____mode the output is _____ for 0% and

   _____ for 100%

   In the _____mode the output is _____ for 0% and

   _____ for 100%

5. Draw a typical by-pass control installation and explain its function.

   This mode of control is not considered a true mode of control as there is no

   _____ alteration performed when the measured value or Process

   Variable (PV) deviates from the_____ (SP). However it could be

   used when the plant is _____ up or _____ down or when the

   control valve is being _____ or _____

6. Where would you typically use:

   a. Automatic control

   b. Manual control (2 examples)

7. Why is it important to achieve 'bumpless transfer' when switching from Automatic to manual control (and vice-versa)?

8. The phrase "3 term controller" refers to a controller that has three actions. These are:-

a)

b)

c)

These can be used singly or combined together to give different modes of control.

9. Feedback control occurs when a correction to the plant is made _____ a

_____ from the set point or _____ value has

occurred.

Draw a feedback system

10. The opposite of feedback control is _____ control. In this mode of

control, the process plant is automatically adjusted _____ to the

_____ variable changing. This has the advantage of producing

a more _____ plant.

11. Draw the connections on the back of a Moore controller showing where the transmitter is connected. Also show where and how a pneumatic control valve would be connected.

12. What is the resistors function?

Mycro 352 Controller Layout