Temperature control - TEM


This laboratory is designed for the study of the temperature control application to allow the student a practical training, based on the performance of guided experiments. Industrial type components are educationally adapted by using a modular panel system to permit the step by step assembling from the simplest circuit to the most complex system.

This trainer has a modular structure and it consists of didactic panels installed on a vertical frame. It is supplied with a theoretical and practical manual. The modularity of this didactic system can give the students a direct and immediate approach to the topics, offering the opportunity to study various subjects, performing several experiments as following:

- With this laboratory it is possible to perform the following experiments:
- The two position controller in the temperature process
- The two position controller with delayed feedback in the temperature process
- The two position controller with elastic feedback in the temperature process
- The three range controller in the temperature process
- P, PI and PID controls of the temperature process using the CHR method


## List of modules for experiments:

|  |  | MODULES |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | $\underset{\sim}{\underset{\sim}{\sim}}$ |  | $\begin{aligned} & \text { N} \\ & \text { N} \\ & \text { an } \end{aligned}$ | $\begin{aligned} & \text { N } \\ & \text { O} \\ & \text { a } \end{aligned}$ | $\begin{aligned} & \text { N } \\ & \stackrel{N}{0} \\ & \text { a } \end{aligned}$ | $\begin{aligned} & \infty \\ & \stackrel{\infty}{0} \\ & \overrightarrow{0} \end{aligned}$ | $\begin{aligned} & \text { on } \\ & \stackrel{N}{0} \\ & \stackrel{1}{2} \end{aligned}$ | $\begin{aligned} & \underset{\mathbf{\omega}}{\mathbf{0}} \\ & \underset{\Delta}{1} \end{aligned}$ | $\begin{aligned} & \text { ® } \\ & \underset{\sim}{0} \\ & \stackrel{\rightharpoonup}{0} \end{aligned}$ |  |  | $\begin{aligned} & 3 \\ & \underline{4} \\ & \vdots \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { M } \\ & \underset{\sim}{\mathbf{O}} \end{aligned}$ |  |  |
| 1 | Controller with 2 positions | 1 | 1 |  |  |  |  | 1 | 1 | 1 |  |  | 1 | 1 | 1 | 1 |
| 2 | Controller with 2 positions, delayed feedback | 1 | 1 |  | 1 | 1 |  | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | Controller with 2 positions, elastic feedback | 1 | 1 |  | 1 | 1 |  | 1 | 1 | 1 |  | 1 | 1 | 1 | 1 | 1 |
| 4 | Controller with 3 ranges | 1 | 1 |  | 1 |  | 1 | 2 | 1 | 1 |  | 1 | 1 | 1 | 1 | 1 |
| 5 | Regulation P, PI e PID of temperature, CHR method | 1 | 1 | 1 |  |  |  |  | 1 | 1 |  | 1 | 1 | 1 | 1 | 1 |
| 6 | TOTAL | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

