➤ **Instrumentation & Control**

M41. **Resistance Transducers**

GENERAL DESCRIPTION

This unit allows different practices related to resistance transducers to be carried out. The unit has five different types of transducers: PTC, NTC, LDR, strain gauge and RTD.

The operation of thermistors is based on the principle that the resistance of some materials varies as their temperature changes. When the temperature of the material changes, its resistance varies and can be simply measured and calibrated according to the input quantity. The most commonly used thermistors are made of ceramic semiconductor materials, such as manganese, nickel and cobalt oxides. Thermistors can be used for temperature measurement, as electrical power sensing devices and also as control for various processes.

With the Resistance Transducers unit, "M41", designed by EDIBON, we can study techniques for the measurement of various physical quantities, such as temperature, light intensity, displacement, force, etc., using resistance transducers.

PRACTICAL POSSIBILITIES

1.-Study of the properties of NTC for the measurement of temperature.

2.-Study of the properties of PTC for the measurement of temperature.

3.-Study of the properties of LDR for the measurement of light intensity.

4.-Study of the properties of RTD for the measurement of temperature.

5.-Study of the properties of strain gauge for the measurement of deformation.

-Several other exercises can be done and designed by the user.

DIMENSIONS AND WEIGHTS

Dimensions: 405 x 300 x 350 mm approx.
(15.9 x 11.8 x 13.7 inches approx.)

Weight: 6 kg approx.
(13.22 pounds approx.)

REQUIRED ELEMENTS (NOT INCLUDED)

- FACO. Power Supply.

SPECIFICATIONS

The unit has five different types of transducers: PTC, NTC, LDR, strain gauge and RTD.

On the chassis there are a lamp, a heater and the sensors. The lamp is used to control the illumination incident. The unit also include a dark cover box whose aim is to avoid the environmental light noise. The heater is used to control the temperature.

Elements included:

Lamp:
- -Voltage: 12 Vdc.
- -Illumination intensity: 200 lumens.
- -Power dissipation: 5 W max.

Heater resistor:
- -Voltage: 12 Vdc.
- -Power dissipation: 4 W max.

PTC:
- -Resistance @ 25 °C: 100 Ohm.
- -Operating temperature max: +70 °C.

NTC:
- -Resistance @ 25°C: 150 Ohm.
- -Temperature coefficient: -3.9 %/°C.
- -Temperature sensing range: -55 to +150 °C.

RTD:
- -Resistance @ 0°C: 100 Ohm.
- -Sensibility: +0.3851 Ohm/°C.
- -Temperature sensing range: -220 °C to +650 °C.

LDR:
- -Resistance: 5.4K min, 12.6K max.
- -Power dissipation: 250 mW max.
- -Peak wavelength: 550 nm.

Strain gauge:
- -Resistance: 120 Ohm.
- -Power dissipation: 100 mW max.
- -Factor: 2.1.
- -Length: 5 mm.

All the connections of the different sensors and lamp are done using the 2 mm terminals available on the unit front panel, with diagrams describing their functions.