HALLIKAINEN *Instruments*
INDUSTRIAL and SCIENTIFIC

750 NATIONAL COURT, RICHMOND, CALIFORNIA, 94804

THERMODYNE TEMPERATURE CONTROLLER

Non-indicating resistance bulb type (Shell Development Co. Design)

Model 1315

PRINCIPLE OF OPERATION

The THERMODYNE is a general purpose laboratory temperature controller, designed to operate as an "on-off" or proportional controller.

The THERMODYNE is used with a resistance thermometer that is the variable arm in an AC Wheatstone bridge circuit. The bridge is operated at balance by means of an adjustable ratio arm that selects the temperature setting. A change in thermometer resistance produces an AC voltage which is amplified by a resistance coupled amplifier. This amplified AC voltage is then applied as a bias voltage to a thyraton tube energizing an enclosed mercury plunger relay which turns a heater on and off. The controller dead zone, when used as an "on-off" controller is .001°C. using a standard nickel resistance bulb of our manufacture.

During proportional operation, a negative feedback signal is applied to produce an "on" period which is directly proportional to the bridge unbalance voltage. The proportional band (gain) is adustable from 0.023°C. to 5.9°C. (based on the nickel resistance bulb) by means of a ten position gain switch.

Proportional control is by means of time cycle modulation.

A load of up to 25 amps (115 VAC non-inductive) may be connected directly to the terminal board mounted on the back of the instrument chassis. When operating as a proportional controller, only one heater is required, eliminating the multiple heaters usually employed with "on-off" controllers.

SET POINT CONTROLS

Setting of the control point temperature on the standard THERMODYNE is accomplished through the use of two ten-turn potentiometers. One is for coarse and the other for fine setting.

RANGE

The range of the standard THERMODYNE is that of the resistance thermometer used as the primary element. The standard THERMODYNE does not have a calibrated range and is not a direct set instrument.

DECADE MODEL

A special decade model is available that incorporates two ten-position switches in place of one of the ten-turn potentiometers (coarse). Fixed precision resistors are selected to cover a specified range and through the use of these decade switches, permits the resetting of the instrument to an approximate control point or previous temperature setting. The standard decade THERMODYNE ranges are 50° to 500°F. with a nickel resistance thermometer; 400° to 1000°F. with a platinum resistance thermometer, and 1000° to 1500°F. with a platinum resistance thermometer. Other ranges can be supplied at extra cost.

SPECIFICATIONS

Case—The case is constructed of 18 gauge steel, with blue enamelled finish. The front panel is ⅛" duraluminum with etched markings. Over-all dimensions are 10" wide, 7¼" high and 8" deep. A pilot light on the panel indicates the action of the control relay.

Power—30 watts at 115 volt, 60 cycle, AC

Contact rating—25 amps, 115 volts, AC non-inductive
20 amps, 220 volts, AC non-inductive

Connections to case—Terminal board on back of chassis with removable cover on back of case.

Weight—15 pounds

Decade THERMODYNE