

4 ● What refrigerating capacity is required?

5.5 to 7 tons per car.

5 ● What would be the annual operating cost for a car cooling system, using ice, if the car travels 150,000 car miles?

\$2,850.

Chapter 14

TEMPERATURE AND HUMIDITY CONTROL

Apparatus Sensitive to Temperature, Apparatus Sensitive to Relative Humidity, Accessory Apparatus, Temperature Control Systems, Control of Automatic Fuel Appliances, Individual Room Control, Zone Control, Industrial Processes, Air Conditioning Systems

AUTOMATIC controls can be installed on any type of heating, ventilating, or air conditioning system to maintain desired conditions automatically, and with maximum operating economy. The variety of automatic control equipment available is such that a suitable control system can be devised without difficulty, provided that the conditions to be maintained are known and the control equipment is properly chosen. This chapter outlines briefly the various types of control apparatus and indicates the method of their application to typical heating, ventilating, and air conditioning systems. Specific control devices and systems are described in the *Catalog Data Section* of THE GUIDE.

Controls are applied for the following reasons:

1. To maintain conditions required for human comfort and efficiency.
2. To maintain conditions required for industrial processes.
3. To obtain economy in operation.
4. To provide necessary safety measures.

CONTROL APPARATUS

The various pieces of control apparatus may be grouped under the following general headings:

Apparatus Sensitive to Temperature

Temperature-sensitive devices which will respond to changes in temperature, and which will motivate equipment to compensate for the changes, are usually called *thermostats*. They have many specialized forms for use in specific control applications. Thermostats are the detectors of a control system which identify changes in desired temperature conditions and automatically call for compensating action.

Thermostats are actuated by various means, all of which have the common characteristic of responsiveness to small changes of temperature. The actuating element may be a piece of bi-metal in straight, helical, or spiral form (Fig. 1), which, by bending slightly as the temperature changes, actuates an electric or pneumatic *switch* to govern the controlled