

PORTABLE AIR COOLER

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## Chapter 1 INTRODUCTION

Air conditioning is defined as the simultaneous control of temperature, humidity, radiant energy, air motion and cleanliness within the purpose of satisfying the requirement of comfort or a process. Most of us assume that air conditioning is just a cooling process only but as the definition states it is great deal than that. It can be used to cool or warm surrounding temperature, meaning that temperature will be changed to the suitable condition depend on the place. It also can increase or decrease humidity by applying some process. The processes involve in air conditioning are heating, ventilating, cooling and many more. In general, air conditioning systems (air conditioner) actually divided into two types. There are central unit and split unit. Central unit is normally used in large building while split unit is used in small building such as in a room. (See ref. 1).

However, an air conditioning process that widely used nowadays using chemical product as a cooling agent. This will causes ozone depletion to the earth and bad for human health. Besides that, the equipment that uses the principle of air conditioning system, such as air conditioner only is installed at certain place that is indoor area without the ability to remove it again. Therefore, it are unable to use or bring this air conditioner at any place that we like such to the outdoor area. Furthermore, air conditioner is

obtained in a large size of equipment; high cost and only operates by using high electric power supply.

Therefore, the project called PORTABLE AIR COOLER is manufactured because its ability to operate effectively at outdoors area especially in the hot and dry climate. Besides that, the project is lower cost, lighter, portable and able to operate by using small power only. To produce this project, "evaporative cooling" concept that is traditionally cooling concept is used. The principle of evaporative cooling is relatively simple. Air moving past water will cause the water to evaporate. The heat necessary to cause evaporation is drawn out of the passing air stream and hence the air is cooled. Here, known that the water will be used as a cooling agent to replace chemical product. Therefore, the effect of ozone depletion can be reduced. The detail of evaporative cooling concept is explained in Chapter 2.

For target place, this project is suitable to use in climate dry and hot temperature area especially in the Middle East countries such as Saudi Arabia, Sudan, Egypt and others. The temperature in this area normally over than 80F while the humidity is less than 20%. Known that, there are many people go to Makkah (located in Saudi Arabia) every year to perform haji and umrah. In Makkah, they have the problem to adopt themselves to the surrounding that is climate dry and hot temperature. Therefore, this project is very suitable used in helping them to overcome their problem.

Other than that, the project covers the basic theory, design, manufacturing and testing of a PORTABLE AIR COOLER. In achieving this project, among the principle stages, towards the completion of the project are installation of the equipment such as