

HVAC and Refrigeration Preventive Maintenance

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About the Author

Eric Kleinert is a professional with over 40 years of experience in commercial and domestic major appliances; refrigeration; and HVAC sales, service, and installation. He has owned and operated a number of major appliance and air conditioning sales and service corporations. As an instructor for a preeminent technical college, he taught adults aspects of preventative and diagnostic services and techniques, which enhanced their ability to better evaluate products and services necessary to maintain commercial and residential climate-control systems, refrigeration, and major appliances. He is the author of *Troubleshooting and Repairing Major Appliances* (McGraw-Hill, 2012), now in its 3rd edition, and a contributing author of *Handbook of Energy Efficiency and Renewable Energy Technologies* (CRC, 2014).

Introduction

Preventive maintenance practices have a significant effect on air conditioning, heating, ice machines, and refrigeration product's energy use, comfort, and health. A good maintenance program maximizes product performance and life expectancy in the most cost-effective manner.

How many times have you read this statement or heard it from a service company or a manufacturer or something similar?

WARNING! *Failure to perform the required maintenance at the frequency specified in the use and care manual will void the warranty coverage on your new air conditioning and/or heating, ice machine, or refrigeration equipment in the event of a failure.*

To ensure economical, trouble-free operation of the product, the following maintenance is required every *X* number of months. As owners of this equipment, we fail to either read the use and care manual or perform the necessary preventative maintenance until that day comes when our product fails. Then we have to pay a service company to repair the product and pay a lot more money for the repairs.

What is preventive maintenance and why is it important to have it done to your products? Preventive maintenance is a scheduled activity to inspect, adjust, clean, and test your product's performance and to ensure they run efficiently, so the product will have a long service life.

Homeowners and business owners often operate their products until it breaks down, they are practicing reactive maintenance. Reactive maintenance has low upfront costs which degrades the product's performance and reliability. The end result is the homeowner and/or business owner will have high utility bills and a repair bill to replace faulty components including the preventive maintenance bill. In the long run, the costs are high and it lowers the life expectancy of the product. So be proactive, schedule the preventive maintenance on your equipment.

I can only expose you to the knowledge that's needed for proper preventive maintenance in the air conditioning, heating, and refrigeration industry. This will help you save money on unnecessary repairs. If you are a homeowner or business owner, this book can help you decide if you can perform the required preventive maintenance on your product or if it's the one that's best left for the experts. For the beginning maintenance engineer or HVAC/R service technician, what you learn from this book will give you the keys for a rewarding service career. And for the experienced HVAC/R professional, this book will serve as a good resource and refresher on the proper techniques in performing preventive maintenance on air conditioning, heating, ice machine, and refrigeration equipment.

This book is divided into two sections. Section One—Chapters 1 to 8, covers safety practices, tools needed to perform the maintenance procedures, indoor air quality (IAQ) and air filtration, test, adjust, and balance (TAB) air conditioning equipment and ductwork, basic refrigeration cycle, basic electricity and electronics (high and low voltages), gas and oil fuels. Section Two—Chapters 9 to 17, will provide you with maintenance instructions on specific types of cooling, heating, and refrigeration equipment. The type of equipment will include room air conditioners, residential air conditioning and heating, residential refrigeration (refrigerators, freezers), commercial air conditioning and heating, water-cooling towers, self-contained commercial refrigerators and freezers, commercial ice machines, troubleshooting techniques, and where to get help. Please note that the information contained in this book is only intended to enhance, rather than replace, the manufacturer’s recommendation on servicing the equipment.

Also, in this section, each preventive maintenance procedure has been rated by a degree of complexity or simplicity. For the owner of the product, you will have to decide whether you can perform the preventive maintenance procedure or if you must call a professional to complete the preventive maintenance procedures on the product. Following are icon/symbols that are used in this chapter to define who should perform the preventive maintenance on the air conditioning, heating, and refrigeration equipment.

Degree of Difficulty Scale



Expert



Hard



Moderate



Easy



Call a certified HVAC service Company



Service technician



Business Owner



Home Owner