

# CHAPTER ONE

## How to Use This Guide

- 💡 **The guide is arranged in an outline form for quick and easy reference.**
  - 👉 Main ideas on a topic are indicated by a light bulb. 💡
  - 👉 Details of that main idea follow below it and are indicated by a light switch. 🗑️
  - 👉 Common mistakes or pitfalls to avoid are indicated by a prohibited sign. 🚫
  
- 💡 **To simplify the technology of steam heating, it is divided into three paths.**
  - 👉 **STEAM UP** is the production and distribution of steam.
  - 👉 **AIR OUT** is the removal of air from the piping and radiation.
  - 👉 **WATER BACK** is the return of the condensed steam (water) to the boiler.
  
- 💡 **Steam Up, Air Out, Water Back are the basis of all steam heating systems.**
  - 👉 No matter how complex or simple, with modifications from original design or not, the system will break down into three paths.
  - 👉 You can follow each path for any type of system.
  - 👉 Once you know the paths, you can look for the problem or road blocks in the paths.
  - 👉 Correcting that problem or clearing that roadblock will fix any job.



**Explanations of the different types of steam heating systems are broken down into the simplest terms.**

- The approach of the book is direct. Follow the paths.
- Identify the problem by looking at the system as three paths.
- Understand what is supposed to happen in each path.
- Find the trouble in a path and fix the problem.
- Always look at the problem with the three paths in mind, as the basis for your analysis.



**The common terms of steam heating are defined and illustrated in Chapter 2 “Steam Basics” on pages 14 through 17.**

- Refer to this glossary of common terms whenever you are not completely sure of any item or part.



**Chapter 2 combines the three paths into easy to understand color diagrams labeled with the terms we will use in the guide.**




- It is designed to familiarize the reader with the whole process using simplified diagrams and explanations.
- It is a good review for any level of experience.
- It is the foundation from which you can build a complete understanding of any system.






**The troubleshooting guides in Chapter 6 are the quickest routes to solving 27 common problems.**

- There is a listing of the most common problems found in the field.
- Each problem has a flow chart to help you locate the source of that problem and help you reach a solution.
- Steps of the flow chart are referenced back to chapter explanations in the main chapters.
- Review the explanations as you go through the chart.
- Don't skip the explanation, unless you are completely familiar with the path.



 **The three main chapters, Steam Up, Air Out, Water Back, explain each path in easy to reference outline form with color diagrams to help visualize the flow of steam, air, and water through the system.**

-  Each chapter is designed to familiarize the reader with the individual path in order to troubleshoot problems not included in this guide.
-  With so many different types of systems experiencing varied levels of maintenance, questionable modifications and multiple boiler replacements through the years, you will have to understand the three paths because you never know what you'll find in somebody's basement.
-  The chapter introductions will explain the importance of that subject and take you step by step through the sequence of flow in that path.





 **To begin troubleshooting in the field, start in the boiler room with the guide open on top of the boiler.**

-  Make sure the boiler will fire.
-  This guide does not attempt to solve combustion or electrical problems.
-  Start at Chapter 2 for basic theory or a quick refresher.

 **Check near boiler piping while in the boiler room.**







-  Refer to the manufacturer's instructions if left with boiler paperwork.
-  Refer to **pages 56 through 63** for piping sizes and fundamental near boiler piping arrangements.

 **Check the gauge glass while the boiler is firing.**

-  Note the level of the water line before the boiler starts to make steam.
-  Refer to **pages 38 and 39** for normal water line position.
-  Observe the water line as the boiler makes steam.
-  Refer to **pages 34 and 35** to check for a "dirty" boiler.





**Get out of the boiler room to observe the piping and follow the paths of the steam, air, and water through the system.**

-  Always find the end(s) of the steam main(s).
-  Look at the piping connections at the end of the mains for vents and traps.
-  Listen for the release of air out of the main vents.
-  Look at the piping connections at the radiation to determine if it's a one or two pipe system.
-  Look at the piping connections at the riser takeoffs.
-  Use a level to determine pitch of piping. Make sure water flows in the right direction.





**Now that you're familiar with the system, go to Chapter 6, the troubleshooting guide, to look for specific problems.**

-  Try to match the problem described by the homeowner or building manager to problems listed on **page 125**.
-  Be careful with other's description of the problem. They can easily mislead you.



**Go to Chapter 3 to work on non-specific problems, multiple symptom problems, or to improve the overall performance of the system.**

-  The production and distribution of the steam are fundamental to system performance.
-  Always start with Steam Up when problems don't show up in the troubleshooting guide.