

# Technician's Guide & Workbook

# for **Quality** Installations



**Supports HVAC Quality  
Installation Specification  
ANSI/ACCA 5 QI-2015**



# TECHNICIAN'S GUIDE & WORKBOOK FOR QUALITY INSTALLATIONS

2015

[A Compendium to ANSI/ACCA 5 QI-2015  
*HVAC Quality Installation Specification*]

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## INTRODUCTION

This Guide & Workbook explains the *HVAC Quality Installation Standard (QI Standard)* procedures. Steps that are necessary for the Technician to complete and document for compliance with *QI Standard* are discussed in detail. Each section concludes with work exercises, in blue print, designed to clarify and enhance the training material and a section in green that identifies hands on activities that can be done on a job site or in an HVAC lab class. Once this Guide & Workbook are completed, a skilled Technician with the appropriate tools and manufacturer's manuals, can obtain data and measurements that are verifiable and repeatable.

The Guide & Workbook follows the flow of the *QI Standard* and uses the same numbering system for ease of cross reference. Included here are generic instructions on the use of measurement tools mentioned in each section of the *QI Standard*. Examples and illustrations include various types of testing and diagnostic instrumentation and equipment. The Guide & Workbook provides a broad perspective on available tools, with emphasis on tools specifically mentioned in the *QI Standard*. Technicians can use this Guide & Workbook to help in the selection of an appropriate measurement instrument for a specific job.

The *QI Standard's* design sections (sizing, duct design, and equipment selection) are covered briefly, with focus on the required documentation. ACCA has technical documents that aid in all facets of that design. Manual J®, Manual D®, Manual N®, Manual S®, Manual RS®, Manual T®, Manual Q®, and Manual CS® need to be utilized for a system installation to be compliant with the *QI Standard*.

The *QI Standard* requires the installing contractor to provide equipment documentation, and owner/operator, operation instructions. Documentation generated by following the directions in each of the Guide & Workbook's procedural sections has been designed to meet the *System Documentation and Owner Education Aspects* section of the *QI Standard's* requirements.

In the Guide & Workbook, generic directions are given for measuring methods to provide Technicians with a snapshot of what each procedure will entail. Directions given are intended as a supplement, and are not to be used as a replacement for individual tool instrument manufacturer's manuals or instructions.

Errors that frequently occur in the field are identified where pertinent, to save Technicians time and costly mistakes. However, for a more comprehensive understanding of test and balance procedures, and advanced methodologies, it is recommended that ACCA's Manual B *Balancing and Testing Air and Hydronic Systems* be consulted.

For clarity and consistency, the symbol for section (§) will be used exclusively when the referenced section refers to the *QI Standard*. When the word "section" is used it refers to sections in this Guide & Workbook.

Appendixes 1 through 8 were developed to help Technicians by providing details on math procedures, general information on tools, complete instructions for some required tests, and sample charts for organizing and recording data.

The *Technician's Guide & Workbook for Quality Installation* was written to provide every Technician with the information necessary to prepare for and complete an HVAC installation per the *QI Standard*.

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## 1.0 PURPOSE *(Reference: §1.0 of the QI Standard)*

The ANSI/ACCA 5 QI-2015 *HVAC Quality Installation Specification (QI Standard)* establishes the proper installation criteria for residential and commercial HVAC systems. When the total QI Standard installation is completed, occupant/owner demands for energy efficiency, comfort, and indoor air quality should be achieved for commercial and residential HVAC applications. Further, the occupant/owner will be provided with the essential information for maintaining and servicing the new equipment.

## 2.0 SCOPE *(Reference: §2.0 of the QI Standard)*

This Guide & Workbook directly follows the outline of the *QI Standard* and illustrates procedures for obtaining the information and for meeting the requirements in the *QI Standard*. Unless otherwise stated procedures apply to the installation of new HVAC Systems and new HVAC equipment that is added to existing systems. However, the measurements and data obtained becomes a record of how the equipment was operating at start up. The original measurements and data can be used over time to evaluate if the HVAC system is still performing like new.

Equipment types are defined and covered in §2.1 and §2.2 of the *QI Standard*. Single-and multi-zone residential and commercial cooling and heating equipment are addressed by the *QI Standard*. Types of equipment covered are listed below:

### Equipment *(Reference: §2.0 of the QI Standard):*

Unitary air conditioners and air-source / water-source heat pumps and geothermal heat pumps, furnaces (gas-fired, oil-fired, electric, and other) Boilers (gas-fired, oil-fired, electric, and other). See Figure 1.

#### EXCEPTIONS:

Due to the difference in design and control requirements, built-up systems (i.e., chillers, custom or specialty-built penthouse units, etc.) are not included in the *QI Standard*.

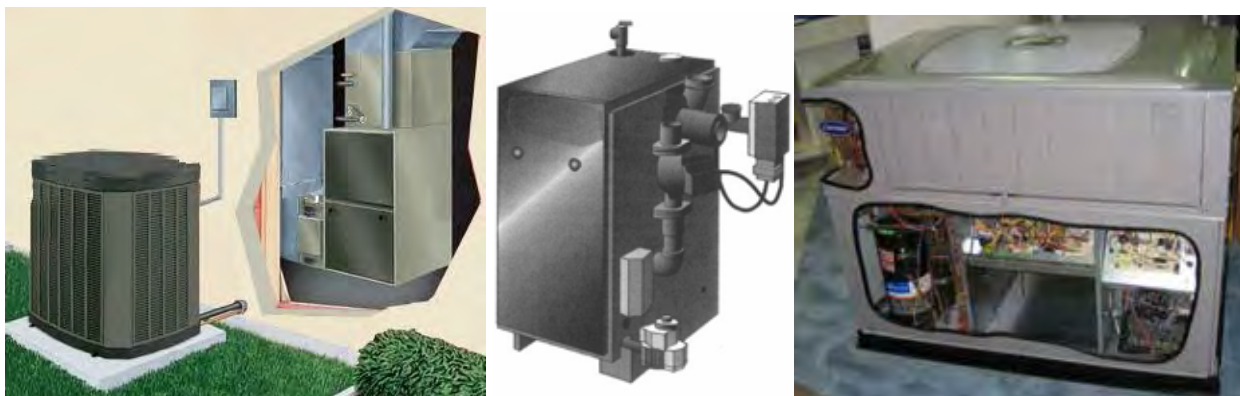


Figure 1: Equipment Types, Split System (left), Boiler (center), Package Unit (right)