

ASHRAE STANDARD

Practices for Measurement, Testing, Adjusting, and Balancing of Building Heating, Ventilation, Air-Conditioning, and Refrigeration Systems

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**American Society of Heating, Refrigerating
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This Foreword is not part of this Standard but is included for information purposes only.

FOREWORD

Technical Committee 9.7 recommended a standard be written for testing and balancing in order to unify procedures for the industry and to aid design engineers in writing a testing and balancing specification that would encompass the ramifications of HVAC system test and adjustment.

Field test results are considered essential to designers, manufacturers, and installers to better enable them to evaluate the results of their design, equipment performance, and installation techniques under actual operating conditions.

To improve on the quality of field testing and reporting, instrumentation and testing techniques are considered in this Standard.

The Standard does cover causes that can affect a system's performance.

It is the intent of this Standard to convey the message "not all is perfect in HVAC systems", so that one should not expect explicit perfection under the present "state of the art". However, with good engineering practice, realistic ratings and craftsmanship installation, adequate results can be obtained to satisfy a given set of design conditions within a reasonable set of limitations.

Testing, adjusting, and balancing are the means used to determine and monitor system performance and may be utilized again and again well after the project is completed.

Testing and balancing reports should be used:

- a. *to assist personnel responsible for the efficient operation of the HVAC systems,*
- b. *as a record of existing conditions,*
- c. *to compare periodic tests to original conditions for determining deterioration or reduced efficiency if any exist,*
- d. *for conditions when modifications or changes are made in the HVAC system,*
- e. *in energy conservation programs as existing conditions for base energy level calculations,*
- f. *for procedures and reports that can be used to verify energy conservation results,*
- g. *for comparison of design versus actual field performance.*

1. PURPOSE

1.1 The purpose of this Standard is to:

- a. Provide uniform and systematic procedures for making measurements in testing, adjusting, balancing and reporting the performance of building heating, ventilation, air-conditioning, and refrigeration systems in the field.
- b. Provide means of evaluating the validity of collected data considering system effects.
- c. Establish methods, procedures, and recommendations for providing field collected data to designers, users, manufacturers, and installers of system.

2. SCOPE

2.1 This Standard describes methods for evaluating building heating, ventilation, air-conditioning, and refrigeration systems.

2.1.1 It applies to air moving and hydronic systems, including associated air moving, circulating heat transfer fluid systems, refrigeration, electrical power, and control systems.

2.1.2 The Standard includes methods for determining temperature, enthalpy, velocity flow rate, pressure, pressure differential, voltage, amperage, wattage, and power factor.

2.2 This Standard establishes:

- a. Minimum system configuration requirements to assure that the system can be field tested and balanced.
- b. Minimum instrumentation required for field measurements.
- c. Procedures for field measurements used in testing and in balancing.
- d. A format of recording and reporting test results for use in evaluating conformance with design requirements.

3. DEFINITIONS & SYMBOLS

accepted contract documents: design plans and specifications which are the basis for an installed mechanical system.

air duct: a passageway made of sheet metal or other suitable material not necessarily leak tight, used for conveying air or other gases at low pressures. It can, be designated according to the function shown in Fig. 1.

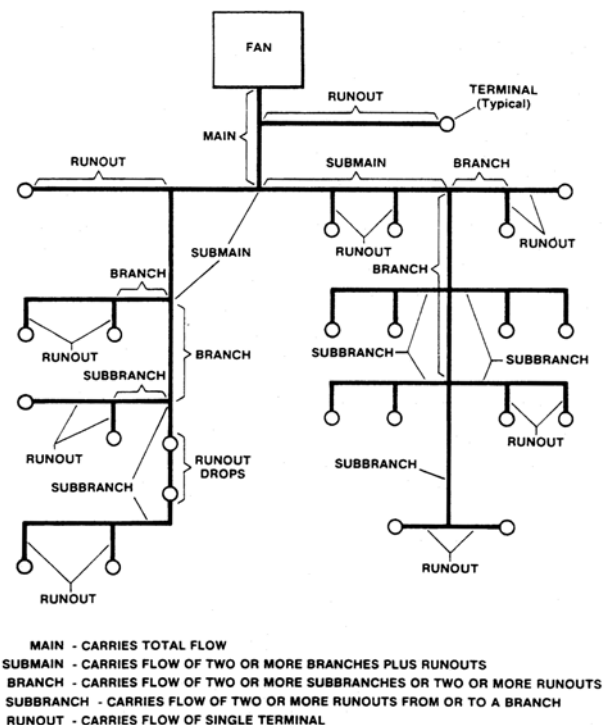


Figure 1 Duct definition criteria by reason of flow values.