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ANSI/ASHRAE Standard 41.3-2025
Standard Methods for Pressure Measurements

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Preview

NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.

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FOREWORD

First published in 1989, Standard 41.3 is intended to help users select and apply suitable pressure measurement instruments. This 2025 revision of ANSI/ASHRAE Standard 41.3 includes an improved method for determining when steady-state operation has been achieved for data recording, as well as changes to make it easier for higher-tier standards to adopt this standard by reference. This standard also meets ASHRAE's mandatory language requirements.

Whether pressure measurements are to be taken in a laboratory or in the field, selecting the appropriate instruments and components should be based on the required measurement accuracy or uncertainty. Once an instrument has been selected, the user may need to consult with the source regarding installation specifics, operating range limits, and calibration limits in order to obtain the expected measurement accuracy.

1. PURPOSE

This standard prescribes methods for pressure measurements under laboratory and field conditions.

2. SCOPE

This standard applies to pressure measurements under laboratory and field conditions for testing heating, ventilation, air-conditioning, and refrigeration systems and components.

3. DEFINITIONS

***accuracy*:** the degree of conformity of an indicated value to the true value.

error: the difference between the observed value of the measurand and its true value.

measurement system: the instruments, signal conditioning systems if any, and data acquisition system if any.

operating tolerance limit: the upper or lower value of an operating tolerance that is associated with a test point or a targeted set point.

post-test uncertainty: an analysis to establish the uncertainty of a test result after conducting the test.

pretest uncertainty: an analysis to establish the expected uncertainty of a test result before conducting the test.

random error: the portion of the total error that varies randomly in repeated measurements of the true value throughout a test process.

***sensitivity*:** the change of output for a unit change of input.

steady-state criteria: the criteria that establish negligible change of pressure or pressure difference with time.

systematic error: the portion of the total error that remains constant in repeated measurements of the true value throughout a test process.

targeted set point: a specific set of test conditions where the required pressure or pressure difference is known and has an associated operating tolerance.

test point: a specific set of test operating conditions for recording data where the measured pressure or pressure difference is unknown and has an associated operating tolerance.

true value: the unknown, error-free value of a test result.

uncertainty: the limits of error within which the true value lies.

unit under test (UUT): equipment that is subjected to pressure measurements.

4. CLASSIFICATIONS

4.1 Pressure Categories. The types of pressures used in this standard are listed below and shown in Figure 4-1:

a. Absolute pressure, Pa (psia)
b. Ambient pressure, Pa (psia)
c. Barometric pressure, Pa (psia)
d. Pressure difference, Pa (psid)

Preview