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ANSI/ASHRAE Standard 158.2-2024
Methods of Testing Capacity of Refrigerant Pressure Regulators

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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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(This foreword is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard. It has not been processed according to the ANSI requirements for a standard and may contain material that has not been subject to public review or a consensus process. Unresolved objectors on informative material are not offered the right to appeal at ASHRAE or ANSI.)

FOREWORD

This standard was written at the request of the Air Conditioning Heating & Refrigeration Institute (AHRI) to provide a standard method of test for the capacity of refrigerant pressure regulators. AHRI Standard 770, Performance Rating of Refrigerant Pressure Regulating Valves (I-P/2014) *and AHRI Standard 771,* Performance Rating of Refrigerant Pressure Regulating Valves (SI/2014)*, require that this standard be used as a method of test for capacity. AHRI will continue to maintain Standard 770/771 as it relates to standard methods of rating refrigerant service pressure regulators. Standard 770/771 may also include information concerning other refrigerant pressure regulator performance characteristics.*

This standard provides a means of accurately measuring the refrigerant mass flow capacity of regulators. The flow capacity may be expressed in terms of refrigerating effect with various refrigerants by performing simple thermodynamic computations. Examples of the computations necessary to express regulator capacity in kilowatts (tons) or other appropriate units are included in Informative Appendix C of this standard for the user's convenience.

The basis for the method of testing and calculation of capacity for flow through regulators is a research project (PRF 5233) performed at Ray W. Herrick Laboratories, Purdue University, Lafayette, IN, and sponsored by AHRI. This research followed a study performed at Herrick Laboratories, under the auspices of AHRI, by R.T. McKenzie, J.B. Chaddock, and W.E. Fontaine between September 1963 and September 1966.

The 2024 edition of Standard 158.2 makes minor editorial changes and further aligns the standard with ASHRAE policy regarding systems of units and mandatory language.

1. PURPOSE

This standard provides methods of determining the mass flow capacity of refrigerant pressure regulators with sufficient accuracy to facilitate proper engineering application of the device in systems operating at various conditions with various refrigerants by

a. Prescribing a method of measuring key flow and gradient characteristics of refrigerant pressure regulators using air or water as the working fluid and
b. Prescribing computational means to enable reliable prediction of refrigerant vapor and liquid mass flow capacity based on the measured flow and gradient characteristics

2. SCOPE

2.1 This standard applies to refrigerant pressure regulators that meet the definition found in Section 3 and that are intended for refrigerant service in applications where only single-phase flow occurs within the regulator.

2.2 This standard is applicable to refrigerant pressure regulators

a. For use in either liquid or vapor refrigerant applications and
b. For use with refrigerants deemed suitable according to ANSI/ASHRAE Standard 15[1] and ANSI/ASHRAE Standard 34[2]

2.3 This standard specifies procedures, apparatus, and instrumentation that will produce capacity and gradient information with sufficient accuracy to support the proper application of the tested regulator.

2.4 This standard does not

a. Specify rating conditions or electrical or mechanical design requirements (rating conditions may be found in ARI Standard 770 [3]) or
b. Make recommendations for safety or
c. Specify tests for production, specification compliance, or field testing of regulators

3. DEFINITIONS AND SYMBOLS

3.1 Definitions

capacity: the mass flow rate of a selected refrigerant that will pass through the regulator at specified conditions.

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