ANSI/AHRI Standard 760-2007
(Formerly ARI Standard 760-2007)

2007 Standard for

Performance Rating of Solenoid Valves for Use with Volatile Refrigerants

Approved American National Standard
ANSI

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Note:

This standard supersedes ARI Standard 760-2001.

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PERFORMANCE RATING OF SOLENOID VALVES FOR USE WITH VOLATILE REFRIGERANTS

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to establish for Solenoid Valves: definitions; test requirements; rating requirements; minimum data requirements for Published Ratings; marking and nameplate data; and conformance conditions.

1.1.1 *Intent.* This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors and users.

1.1.2 *Review and Amendment.* This standard is subject to review and amendment as technology advances.

Section 2. Scope

2.1 *Scope.* This standard applies to Solenoid Valves for use with Volatile Refrigerants as defined in Section 3.

Section 3. Definitions

All terms in this document follow the standard industry definitions in the current edition of *ASHRAE Terminology of Heating, Ventilation, Air Conditioning and Refrigeration* unless otherwise defined in this section.

3.1 *Bubble Point.* Refrigerant liquid saturation temperature at a specified pressure.

3.2 *Dew Point.* Refrigerant vapor saturation temperature at a specified pressure.

3.3 *Main.* Tubing or piping by which the Solenoid Valve is connected to the apparatus.

3.4 *Maximum Operating Pressure Differential (MOPD).* The maximum pressure difference between the solenoid valve inlet and the solenoid valve outlet at which the Solenoid Valve will operate, psi [kPa].

3.5 *Pressure Drop.* The pressure difference between the solenoid valve inlet and the solenoid valve outlet with the main port (orifice) open, psi [kPa].

3.6 *Published Rating.* A statement of the assigned values of those performance characteristics, under stated Rating Conditions, by which a unit may be chosen to fit its application. These values apply to all units of like nominal size and type (identification) produced by the same manufacturer. The term Published Rating includes the rating of all performance characteristics shown on the unit or published in specifications, advertising or other literature controlled by the manufacturer, at stated Rating Conditions.

3.6.1 *Application Rating.* A rating based on tests performed at application Rating Conditions (other than Standard Rating Conditions).

3.6.2 *Standard Rating.* A rating based on tests performed at Standard Rating Conditions.

3.7 *Rating Conditions.* Any set of operating conditions under which a single level of performance results and which causes only that level of performance to occur.

3.7.1 *Standard Rating Conditions.* Rating Conditions used as the basis of comparison for performance characteristics.

3.8 *"Shall" or "Should."* "Shall" or "should" shall be interpreted as follows:

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3.8.1 *Shall.* Where "shall" or "shall not" is used for a provision specified, that provision is mandatory if compliance with the standard is claimed.

3.8.2 *Should.* "Should" is used to indicate provisions which are not mandatory but which are desirable as good practice.

3.9 *Solenoid Valve.* A valve which is actuated by the magnetic action of an electrically energized coil. The opposite action is accomplished by gravity, pressure or spring action.

3.9.1 *Direct-Action Solenoid Valve.* A valve in which the magnetic power of an electrically energized coil moves the main port (orifice) closure member.

3.9.2 *Normally Closed Solenoid Valve.* A valve which is closed when de-energized. When the coil is electrically energized, the closure member is moved away from and off the port (orifice) to cause the opening action.

3.9.3 *Normally Open Solenoid Valve.* A valve which is open when de-energized. When the coil is electrically energized, the closure member is moved toward and onto the port (orifice) to cause the closing action.

3.9.4 *Pilot-Operated Solenoid Valve.* A valve in which the motion of a direct-acting member allows a pressure difference to occur across the main port (orifice) closure member, causing it to move.

3.10 *Solenoid Valve Capacity*. The mass flow rate of a fluid through the Solenoid Valve, equated to tons of refrigeration [kW] at the specified conditions.

Section 4. Test Requirements

4.1 *Capacity Tests.* All capacity tests shall be in accordance with the test procedure outlined in ANSI/ASHRAE Standard 158.1.

4.2 *MOPD Tests.* All MOPD tests shall be in accordance with the test procedure in Appendix C.

4.2.1 If the Solenoid Valve MOPD depends on the valve position, the valve shall be tested in all positions for which the ratings apply.

Section 5. Rating Requirements

5.1 *Rating Requirements.* Published capacity ratings shall consist of Standard Ratings and may include Application Ratings. The AHRI Standard Ratings of Solenoid Valve Capacity for Volatile Refrigerants shall be stated in tons of refrigeration [kW] and at the conditions specified in Table 1

5.2 *Standard Rating Conditions.* Standard ratings shall be for liquid service applications of solenoid valves per Table 1.

5.2.1 *Liquid Service Solenoid Valve Entrance Conditions.*

a. *Saturated Condensing (Dew Point) Temperature*: 110°F [43.3°C]
b. *Liquid Service Temperature*: 100°F [37.8°C]
c. *Saturated Evaporating (Bubble Point) Temperature*: 40°F [4.4°C]

5.2.2 *Pressure Drop Values.*

5.2.2.1 *Liquid Service.* The Pressure Drop across the Solenoid Valve shall be the closest integer value in psi [kPa] equivalent to a 1.0 °F [0.6 °C] drop in saturation temperature.

5.2.3 In no case shall the Pressure Drop be less than required for proper operation of the Solenoid Valve.

Table 1. Standard Rating Conditions

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