Brushless Synchronous Machines—500 kVA and Larger

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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

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1 General

1.1 Scope

1.1.1 This standard covers the minimum requirements for form-wound and bar-wound brushless synchronous machines 500 kVA and larger for use in petroleum, chemical, and other industrial applications. This standard includes synchronous motors and generators with two different rotor designs:

a) salient-pole type rotors with solid or laminated poles;

b) cylindrical type rotors with solid or laminated construction.

Notes following a paragraph in Section 1 through Section 8 are informational only and are not enforceable as part of this standard.

Some paragraphs have intentionally been left blank to align paragraph numbers with API 541.

A round bullet (●) at the beginning of a paragraph indicates that either a decision is required or further information is to be provided by the purchaser. This information shall be indicated on the datasheets (see Annex A or Annex B); otherwise, it shall be stated in the quotation request or in the order.

A diamond bullet (♦) at the start of a paragraph indicates additional requirements for motors applied with an adjustable speed drive (ASD).

1.1.2 The purchaser specifies machine details and features by completing the associated sections of the datasheets in Annex A or Annex B.

NOTE Guidance for completion of the datasheets is provided in Annex D and Annex E.

1.1.3 The vendor completes the details and features in the vendor section of the datasheets (see Section 8 and Annex A or Annex B).

1.1.4 Within this standard, the term “motor” addresses synchronous motors as well as synchronous motor-generators that are subjected to an asynchronous start. The term “machine” addresses the three types of machines: motors, generators, and motor-generators.

1.1.5 Super synchronous motor applications are addressed in Annex I.

1.2 Alternative Designs

The vendor may offer alternative designs in accordance with 8.4.

1.3 Dimensions and Standards

● **1.3.1** Both the metric [International System of Units (SI)] and United States customary (USC) system of units and dimensions are used in this standard. Data, drawings, and hardware (including fasteners) related to equipment supplied to this standard shall use the system of units specified by the purchaser. An alternate system of units for hardware (including fasteners and flanges) may be substituted if mutually agreed upon by the purchaser and the vendor.

● **1.3.2** This document recognizes two different systems of standards for the manufacturing and testing of electrical machines: North American standards including the American National Standards Institute (ANSI), the Institute of Electrical and Electronics Engineers (IEEE), and the National Electrical Manufacturers Association (NEMA) and international standards including the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO) standards. The North American standards are the