IEEE 841: A Standard that Works

For many years industrial motor users struggled with properly specifying motors for their most severe applications. While NEMA clearly defined and standardized motor ratings and performance, there was no consistent definition for motors used in the most severe environments. This was particularly evident in process industries, especially in refining, paper making, and mining.

Each manufacturer offered a different version of a “severe duty” motor. This approach left users in a position where they had to review each product for features. Without a measurable standard, the evaluation process was difficult at best, and still did not address actual performance. The “severe” duty motor of one manufacturer might simply mean it was made of cast iron parts. Another might include shaft seals, and a third might mean it has an internal coating to protect from rust and contamination. Motor efficiency was treated as a separate topic.

This began to change with the introduction of an IEEE Recommended Practice (IEEE std. 841-1986.) This later became a Standard for Petroleum and Chemical Industry, (1994) with revisions in 2001 and 2009. Because of the cooperative effort of the user community and manufacturers, today IEEE 841 is recognized globally as an efficient and proper way to specify motors, regardless of manufacturer. The standard begins by defining usual service conditions which include humid, corrosive, or salty atmospheres. Class I, division 2 classified areas, which limit the external and internal surface temperature of the motor, are also considered “usual”. Electrical performance and construction, mechanical performance and construction, temperature, sound, vibration, and testing are all defined for specific environments and service. From the beginning efficiency was included, and the current standard is based upon NEMA Premium® values.

As a result, leading motor manufacturers produce a separate line of motors that are in full compliance with the standard. When compared to older standard TEFC industrial motors, IEEE 841 motors are more efficient (NEMA Premium,) lower temperature rise, low in sound power, and lower in vibration. By definition these motors are of all cast iron construction, and include non-contact rotating labyrinth shaft seals. Leads are sealed as they exit the frame. Attention is given to motor mounting; the motor feet are guaranteed to be in the same plane. The result is a standard motor that provides a very low cost of ownership. Less energy consumed, low installation costs, low maintenance, and high reliability are the hallmarks for this product.

IEEE 841 motors are the default choice in North American refining, chemical processing, paper making and wood yards, non-hazardous area mining installations, and are commonly used in many other industries where value is measured by the total cost of ownership.

In summary, through the collaborative efforts of users and manufacturers, IEEE 841 motors are available from stock from multiple North American motor manufacturers, in 575V and 460V configurations for coupled, belted, and C-face connections, with a performance guarantee backed up by a 5 year warranty.

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