

UNDERWRITERS LABORATORIES INC. CERTIFICATION REQUIREMENT DECISION

This Certification Requirement Decision is prepared by UL LLC. It is normative for the applicable UL Product Certification Program(s); however, it is currently not part of the UL Standard(s) referenced below.

Product Category (CCN): QXZF

Standard Number: UL 1004-5

Standard Title: Standard for Fire pump Motors

Edition Date: May 9, 2014

Edition Number: 2

Section / Paragraph Reference: 8.3, 10.3, 11.5

Subject: Requirements for motors rated above 600V and greater than 500 hp.

DECISION:

8.3 Motors rated above 600V or greater than 500 hp are energized with the rotor locked at rated voltage and frequency for 3 seconds or until the locked-rotor current begins to decrease, whichever occurs first. The locked-rotor current is to be measured at the conclusion of the test (see Clause 11.5). After the locked-rotor test, and while still in a heated condition, the motor shall be subjected to the Dielectric Voltage-Withstand Test of UL 1004-1 without evidence of electrical breakdown. The motor shall operate as intended after the application of the dielectric test potential.

10.3 Motors rated above 600V or greater than 500 hp shall have locked-rotor, breakdown, and pull-up torques equal to or greater than the values in Table 10.4.

Table 10.4*
Torque values for motors rated greater than 600V or over 500 hp

<u>Torque</u>	<u>Percentage of Rated Full-load Torque</u>
<u>Locked-rotor</u>	<u>60%</u>
<u>Pull-up</u>	<u>60%</u>
<u>Breakdown</u>	<u>175%</u>

**Per NEMA MG-1 (Table 20.10.1)*

11.5 Motors rated above 600V or greater than 500 hp exceeding the locked-rotor limits in Tables 8.1 or 8.2, as applicable, shall be marked with the measured locked-rotor current; see Clause 8.3.

RATIONALE FOR DECISION:

Motors rated above 600V and greater than 500 hp are considered “large motors (machines)” and covered under Section 20 of NEMA MG-1. These motors are normally built for custom installations and therefore do not necessarily follow Design B (general purpose) performance characteristics.

The CRD clarifies the performance characteristics for firepump motors rated above 600V and greater than 500 hp, specifically:

- The Locked-rotor test time;
- The Locked-rotor, pull-up and breakdown torque limits; and

UL COPYRIGHTED MATERIAL –
NOT AUTHORIZED FOR FURTHER REPRODUCTION OR
DISTRIBUTION WITHOUT PERMISSION FROM  **Documents**
Document Sharing Hub

c) The marking requirements when the locked-rotor exceeds the values in Table 8.1 or 8.2.

Since the purpose of the locked-rotor test is to include the LR current on the motor nameplate to help ensure a properly rated controller is paired with the motor at the time of installation, the locked-rotor test time for firepump motors rated above 600V and greater than 500 hp shall be 3 seconds or until the locked-rotor current begins to decline, whichever occurs first. This ensures the maximum locked-rotor value is captured and minimizes the risk of unnecessarily damaging a custom built motor.

The locked-rotor, pull-up and breakdown torques in table 10.4 of this CRD are aligned with Table 20.10.1 of NEMA MG-1 which covers standard torque limits for large motors.

For small motors (firepump motors rated below 600V and/or less than 500 hp), the controller is expected to be an “off-the-shelf” motor controller for use with a general purpose (NEMA Design B) motor. However, since these motors are custom built for high voltage/high output applications, there are instances where the locked-rotor current may exceed the values in Table 8.1 or 8.2. To facilitate the selection of a properly rated motor controller in those custom installations, the locked-rotor current is required to be provided on the nameplate.

Copyright © 2017 UL LLC

UL LLC, in performing its functions in accordance with its objectives, does not guarantee or warrant the correctness of Certification Requirement Decisions it may issue or that they will be recognized or adopted by anyone. Certification Requirement Decisions are the opinion of UL LLC. in practically applying the requirements of the standard. They do not represent formal interpretations of the standard under American National Standards Institute (ANSI) processes. UL LLC shall not be responsible to anyone for the use of or reliance upon Certification Requirement Decisions by anyone. UL LLC shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the use or reliance upon Certification Requirement Decisions. The electronic version of the Certification Requirement Decision is the current version and previously printed copies may be outdated.

This document is published as a service to UL's certification customers