SECTION 400593 - COMMON MOTOR REQUIREMENTS FOR PROCESS EQUIPMENT

Note that this section has only been edited for NYSOGS standardization and has not been technically edited. The designer shall make all technical edits specific to the project for this section.

This Section specifies electric motors and their accessories normally supplied as part of equipment assemblies. For specific motor types based on application, refer to those equipment Sections.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Single- and three-phase motors for application on equipment provided under other Sections.

[**Motors furnished loose to Project.**]

* + - * 1. Related Requirements:

List other Sections directly related to or affecting Work of this Section. Include Sections specifying information expected to be found in this Section as well as Sections required to describe complete system or assembly requirements.

Section 260526 - Grounding and Bonding for Electrical Systems.

Section 260553 - Identification for Electrical Systems.

* + - 1. REFERENCE STANDARDS

List reference standards included within text of this Section, with designations, numbers, and complete document titles.

* + - * 1. American Bearing Manufacturers Association:

ABMA 9 - Load Ratings and Fatigue Life for Ball Bearings.

* + - * 1. International Electrical Testing Association:

NETA ATS - Standard for Acceptance Testing Specifications for Electrical Power Equipment and Systems.

* + - * 1. National Electrical Manufacturers Association:

NEMA MG 1 - Motors and Generators.

* + - 1. SUBMITTALS

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data:

Submit manufacturer information for each motor furnished loose.

Indicate nameplate data, compliance with specified standards, electrical ratings and characteristics, physical dimensions, weights, mechanical performance data, and support points.

* + - * 1. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

Include separate Paragraphs for additional certifications.

* + - * 1. Qualifications Statements:

Coordinate following Subparagraph with requirements specified in QUALIFICATIONS Article.

Submit qualifications for manufacturer and testing agency.

* + - 1. QUALITY ASSURANCE

Include this Article to specify compliance with overall reference standards affecting products and installation included in this Section.

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Perform Work according to <**\_\_\_\_\_\_\_\_**> standards.

Include following Paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain <**\_\_\_\_\_\_\_\_**> [**copy**] [**copies**] of each standard affecting Work of this Section on Site.
			1. QUALIFICATIONS

Coordinate following Paragraphs with requirements specified in SUBMITTALS Article.

* + - * 1. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
				2. Testing Agency: [**Company**] [**Member of International Electrical Testing Association and**] specializing in testing products specified in this Section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years' [**documented**] experience.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Inspection: Accept materials on Site in manufacturer's original packaging and inspect for damage.
				2. Storage:

Store materials according to manufacturer instructions.

For extended outdoor storage, remove motors from equipment and store separately.

* + - * 1. Protection:

Protect materials from moisture and dust by storing in clean, dry location remote from construction operations areas.

Provide additional protection according to manufacturer instructions.

* + - 1. WARRANTY

This Article extends warranty period beyond one year. Extended warranties may increase construction costs and State enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**>-year manufacturer's warranty for motors furnished loose.
1. PRODUCTS
	* + 1. MOTORS FURNISHED WITH EQUIPMENT

In following Paragraph insert "State of New York Department of Transportation," "Municipality of \_\_\_\_\_\_\_\_ Department of Public Works," or other agency as appropriate.

* + - * 1. Furnish materials according to <**\_\_\_\_\_\_\_\_**> standards.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Motors 3/4 hp and Larger: Three phase.
				2. Motors Smaller Than 3/4 hp Single phase, except motors less than 1/4 hp be equipment manufacturer's standard.
				3. Three-Phase Motors:

Description: Energy-efficient squirrel-cage induction motor with windings to accomplish starting methods and indicated number of speeds.

Comply with NEMA MG 1, Design B.

Characteristics: [**208**] [**230**] [**230/460**] [**460**] <**\_\_\_\_\_\_\_\_**> V, three phase, 60 Hz.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Characteristics: As indicated [**on Drawings**] [**in equipment schedule**].

Service Factor: [**1.25**] [**1.15**] [**1.0**] [**As indicated on Drawings**] [**As indicated in equipment schedule**].

Enclosure: Meet conditions of installation [**unless specific enclosure is indicated on Drawings**].

Design for continuous operation in 104 degree F environment, with temperature rise according to NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.

Insulation System: NEMA Class [**F**] <**\_\_\_\_\_\_\_\_**>.

Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.

Thermistor System (Motor Frame Sizes 254T and Larger): Three Positive Temperature Coefficient (PTC) thermistors embedded in motor windings and epoxy-encapsulated solid-state control relay with wiring to terminal box.

Bearings:

Description: Grease-lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication.

Comply with ABMA 9.

Bearing life is percent failure at rated hours; e.g., L-10 life at 5,000 hours means 10 percent of bearings may be expected to fail at 5,000 hours.

L-10 Life: 200,000 hours.

Stamp bearing sizes on motor nameplate.

Sound Power Levels: Comply with NEMA MG 1.

* + - * 1. Single-Phase Motors:

Description: Permanent split-capacitor type where available; otherwise [**split-phase start/capacitor-run**] [**or**] [**capacitor-start/capacitor-run**] type.

Characteristics: [**115**] [**115/230**] [**230**] <**\_\_\_\_\_\_\_\_**> V, single phase, 60 Hz.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Characteristics: As indicated [**on Drawings**] [**in equipment schedule**].

* + - * 1. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials.
			1. THREE-PHASE MOTORS FURNISHED LOOSE
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=8853&mf=04&src=wd):

designer to provide two manufacturers and approved equivalent for all listed products.

Insert descriptive specifications below to identify Project requirements and to eliminate conflicts with products specified above.

* + - * 1. Description:

Energy-efficient squirrel-cage induction motor with windings to accomplish starting methods and indicated number of speeds.

Comply with NEMA MG 1, Design B.

Characteristics: [**208**] [**230**] [**230/460**] [**460**] <**\_\_\_\_\_\_\_\_**> V, three phase, 60 Hz.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

Characteristics: As indicated [**on Drawings**] [**in equipment schedule**].

Service Factor: [**1.25**] [**1.15**] [**1.0**] [**As indicated on Drawings**] [**As indicated in equipment schedule**].

Enclosure: Meet conditions of installation [**unless specific enclosure is indicated on Drawings**].

Design for continuous operation in 104 degree F environment, with temperature rise according to NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.

Insulation System: NEMA Class [**F**] <**\_\_\_\_\_\_\_\_**>.

Motor Frames: NEMA Standard T-Frames of steel, aluminum, or cast iron with end brackets of cast iron or aluminum with steel inserts.

Thermistor System (Motor Frame Sizes 254T and Larger): Three PTC thermistors embedded in motor windings and epoxy-encapsulated solid-state control relay with wiring to terminal box.

Bearings:

Description: Grease-lubricated anti-friction ball bearings with housings equipped with plugged provision for relubrication.

Comply with ABMA 9.

Bearing life is percent failure at rated hours; e.g., L-10 life at 5,000 hours means 10 percent of bearings may be expected to fail at 5,000 hours.

L-10 Life: 200,000 hours.

Stamp bearing sizes on motor nameplate.

Sound Power Levels: Comply with NEMA MG 1.

Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials.

* + - 1. SOURCE QUALITY CONTROL
				1. Testing: Test motors according to NEMA MG 1, including winding resistance, no-load speed and current, locked rotor current, insulation high-potential test, and mechanical alignment tests.
1. EXECUTION
	* + 1. PREPARATION
				1. Disconnect and remove abandoned motors.
				2. Clean and repair existing motors to remain or those to be reinstalled.
			2. INSTALLATION
				1. Existing Installations:

Maintain access to existing motors and other installations remaining active and requiring access.

Modify installation or provide access panel.

* + - * 1. Install motors securely on firm foundation.
				2. Engraved Plastic Nameplates: As specified in Section 260553 - Identification for Electrical Systems.
				3. Grounding and Bonding: As specified in Section 260526 - Grounding and Bonding for Electrical Systems.
			1. FIELD QUALITY CONTROL

NETA ATS refers to specific ANSI standards and includes procedures and acceptable values for acceptance-testing electrical equipment according to those standards.

Section 4 of NETA ATS stipulates division of responsibility, possibly conflicting with conditions of the contract or general requirements.

* + - * 1. Inspect and test according to NETA ATS, except Section 4.
				2. Perform inspections and tests as listed in NETA ATS, Section 7.15.

END OF SECTION 400593