SECTION 463342 - DIAPHRAGM-TYPE METERING PUMPS

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 includes chemical feed pumps for feeding various chemical solutions. Pump specified in this Section is of the electronically controlled, solenoid-actuated-diaphragm type. Other types of chemical feed pumps are specified elsewhere in this Division.

Check state and local requirements regarding design, installation, and permitting of chemical feed systems. Add specific state and local requirements applicable to this Section.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes: Diaphragm-type metering pumps with accessories.
				2. 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.

* + - 1. COORDINATION
				1. Coordinate Work of this Section with [**plant operations**] [**Director’s Representative**] <**\_\_\_\_\_\_\_\_**>.
			2. SEQUENCING
				1. Sequence Work to prevent interference with [**plant operations**] [**Director’s Representative's operation**] <**\_\_\_\_\_\_\_\_**>.
			3. SCHEDULING
				1. Schedule Work of this Section after finishing concrete work for housekeeping pad and prior to connecting piping work.
			4. 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 certified pump curves showing performance characteristics with pump and system operating point plotted. Include electrical characteristics and connection requirements. Submit manufacturer model number, dimensions, service sizes, and finishes.
				5. Shop Drawings:

Submit detailed and certified dimensional Shop Drawings for materials and equipment, including wiring and control diagrams, performance charts and curves, installation and anchoring requirements, fasteners, and other details.

* + - * 1. Manufacturer's Instructions:

Submit detailed instructions on installation requirements, including storage and handling procedures, anchoring, and layout.

Submit application, selection, and hookup configuration with pipe and accessory elevations. Submit hanging and support requirements and recommendations.

* + - * 1. Field Quality-Control Submittals: Indicate results of Contractor-furnished tests and inspections.
				2. Manufacturer Reports: Indicate that equipment has been installed according to manufacturer's instructions.
				3. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
			1. CLOSEOUT SUBMITTALS
				1. Project Record Documents: Record actual locations and final orientation of equipment and accessories.
				2. Operation and Maintenance Data: Submit maintenance instructions for equipment and accessories.
			2. QUALITY ASSURANCE

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

* + - * 1. Ensure that materials of construction on pump liquid end are compatible with chemicals listed in schedule following END OF SECTION.
			1. DELIVERY, STORAGE, AND HANDLING
				1. Inspection: Accept pumps on-Site in manufacturer's original packaging. Inspect for damage.
				2. Store products in areas protected from weather, moisture, or possible damage; do not store products directly on ground; handle products to prevent damage to interior or exterior surfaces.
1. PRODUCTS
	* + 1. DIAPHRAGM-TYPE METERING PUMPS
				1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=9607&mf=04&src=wd):

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

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

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

Furnish materials according to <**\_\_\_\_\_\_\_\_**> standards.

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

* + - * 1. Description: Electronically controlled, solenoid-actuated, diaphragm-type metering pump.
				2. Capacity:

Discharge Capacity: <**\_\_\_\_\_\_\_\_**> gph

Discharge Pressure: <**\_\_\_\_\_\_\_\_**> psig

Process Fluid Viscosity: <**\_\_\_\_\_\_\_\_**> lbf-s/sq. ft.

* + - * 1. Operation:

Electrical Characteristics:

[**<\_\_\_\_\_\_\_\_> hp ]**[**<\_\_\_\_\_\_\_\_> rated load amperes**].

Voltage: <**\_\_\_\_\_\_\_\_**> V, [**single**] [**three**] phase, 60 Hz.

Maximum [**Fuse Size**] [**Circuit Breaker Size**] [**Overcurrent Protection**]: <**\_\_\_\_\_\_\_\_**> A.

Minimum Circuit Ampacity: <**\_\_\_\_\_\_\_\_**>.

Minimum Power Factor: <**\_\_\_\_\_\_\_\_**> percent at rated load.

Disconnect Switch: Factory mounted [**in control panel**] [**at equipment**].

* + - * 1. Controls:

Analog-to-digital converter for each pump to convert 4- to 20-mAdc pacing signal to pulse output signal for controlling pump stroke frequency; furnish splash-proof and dustproof enclosure.

Electronically controlled solenoid actuator.

Pump stroke length manually adjustable over 3:1 ratio.

Stroke frequency adjustable over 20:1 ratio.

Stroke frequency electronically adjusted by means of integral potentiometer; zero- to 100-percent calibrated dial.

* + - * 1. Materials:

Head and Fittings: [**PVC**] <**\_\_\_\_\_\_\_\_**>.

Diaphragm: <**\_\_\_\_\_\_\_\_**>.

Seal Rings: [**Viton**] <**\_\_\_\_\_\_\_\_**>.

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

As recommended by manufacturer for chemical and process fluid and dosing chemical.

* + - 1. ACCESSORIES
				1. Combination back pressure and pressure relief valve (four-function valve) for each feed pump; constructed of [**PVC**] [**polyvinylidene fluoride**] [**polypropylene**] <**\_\_\_\_\_\_\_\_**>.
				2. Cables: 2-foot pump connecting cable with plug and 10-foot signal input cable.
				3. [**Plastic**] <**\_\_\_\_\_\_\_\_**> wall mounting shelf for each pump.
				4. Calibration Column:

[**One**] <**\_\_\_\_\_\_\_\_**> graduated calibration column; materials of construction compatible with chemicals being used.

Size calibration column for two-minute run time at maximum capacity of largest pump.

1. EXECUTION
	* + 1. INSTALLATION
				1. Mount pump shelf to wall with stainless-steel expansion bolts.
				2. Fasten pump to mounting shelf with stainless-steel bolts.
				3. Install piping accessories in pump suction and discharge as indicated on Drawings.
				4. Connect piping to pump suction and discharge.
				5. Flush piping with clean water.

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

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

* + - * 1. Installation Standards: Install Work according to <**\_\_\_\_\_\_\_\_**> standards.
			1. FIELD QUALITY CONTROL
				1. Pre-operational Check: Before operating system or components, vent air from system to ensure water in pump.
				2. Startup and Performance Testing:

Test metering pump flow rate by measuring drawdown rate on suction side while leaving discharge undisturbed in its normal, steady-state operating condition. Compute capacities by measuring time to fill or by draining calibration column with potable water.

Operate each chemical feed system on clear water for continuous period of four hours, under supervision of manufacturer's representative.

Hydrostatically test system piping for leaks at 150 psig.

* + - * 1. Equipment Acceptance:

Adjust, repair, modify, and replace components of system failing to perform, and repeat tests.

Make final adjustments to equipment under direction of manufacturer's representative.

* + - * 1. Manufacturer Services: Furnish services of manufacturer's representative experienced in installation of products furnished under this Section for not less than <**\_\_\_\_\_\_\_\_**> days on-Site for installation, inspection, field testing, and instructing Director’s Representative in maintenance of equipment.
				2. Furnish installation certificate from equipment manufacturer's representative attesting equipment has been properly installed and is ready for startup and testing.
			1. DEMONSTRATION
				1. Demonstrate system control functions and alarms.
			2. ATTACHMENTS

When relying on separate schedules, tables, illustrations, or forms to specify product requirements, include list of each attachment. Include identical list of attachments in Project Manual table of contents.

Consider including schedule when Project includes more than one pump of each type.

Insert attachments following END OF SECTION. Consider following example when developing Project schedule.

* + - * 1. Chemical Feed Pump Schedule:

CP-1:

[**Manufacturer: <\_\_\_\_\_\_\_\_>.**]

[**Model: <\_\_\_\_\_\_\_\_>.**]

Location: <**\_\_\_\_\_\_\_\_**>.

Pump Type: <**\_\_\_\_\_\_\_\_**>.

Process Fluid: <**\_\_\_\_\_\_\_\_**>.

Dosing Chemical: <**\_\_\_\_\_\_\_\_**>.

Flow Capacity: <**\_\_\_\_\_\_\_\_**>.

Discharge Pressure: <**\_\_\_\_\_\_\_\_**>.

NPSH: <**\_\_\_\_\_\_\_\_**>.

Motor Size: <**\_\_\_\_\_\_\_\_**>.

Voltage/Phase: <**\_\_\_\_\_\_\_\_**>/<**\_\_\_\_\_\_\_\_**>.

CP-2:

[**Manufacturer: <\_\_\_\_\_\_\_\_>.**]

[**Model: <\_\_\_\_\_\_\_\_>.**]

Location: <**\_\_\_\_\_\_\_\_**>.

Pump Type: <**\_\_\_\_\_\_\_\_**>.

Process Fluid: <**\_\_\_\_\_\_\_\_**>.

Dosing Chemical: <**\_\_\_\_\_\_\_\_**>.

Flow Capacity: <**\_\_\_\_\_\_\_\_**>.

Discharge Pressure: <**\_\_\_\_\_\_\_\_**>.

NPSH: <**\_\_\_\_\_\_\_\_**>.

Motor Size: <**\_\_\_\_\_\_\_\_**>.

Voltage/Phase: <**\_\_\_\_\_\_\_\_**>/<**\_\_\_\_\_\_\_\_**>.

END OF SECTION 463342