Acrison®

MODEL 530

Liquid Polymer Preparation Module

1.0 GENERAL

1.1 Scope

Under this section, the contractor shall furnish and install a non-motorized liquid polymer preparation system, with no moving parts, as specified herein.

2.0 PRODUCTS

2.1 General

2.1.1 The liquid polymer preparation module (or system) shall be capable of metering precise amounts of liquid polymer and water and subsequently, processing the mixture to provide a fully activated polymer solution.

The polymer preparation module shall utilize a two-stage activation system to produce a precise, uniform and thoroughly activated solution in an economical and compact package.

2.1.2 All components of the module shall be mounted on an 11 gauge, 304 stainless steel base plate with rolled edges for containment and rigidity. The control panel, rotameter and pump shall be factory mounted on the base plate along with the static activation chamber and other system components. All components shall be mounted, wired and piped by the manufacturer. The unit shall have an open frame for ease of maintenance and to provide visual observation of its operation.

2.2 Components

2.2.1 Diaphragm Type Metering Pump - The preparation module shall be provided with a solenoid-operated diaphragm pump to meter polymer for activation. The pump materials shall be inert to all polymers and carrier materials and shall be capable of handling all liquid emulsion polymers. The pump shall include complete controls for manual stroke length adjustment and an on-board microprocessor controller for stroke frequency control. A stroke rate meter with illumination shall be provided. The pump turn-down range shall be 120:1 with local digital stroke frequency control, and 10:1 with manual stroke length control. The head of the metering pump shall be provided with a thumbwheel bleed valve to allow release of air and ease of priming.

Option - The diaphragm metering pump shall be provided with the ability to accept a 4-20 mA signal for remote control of the stroke frequency.

2.2.2 Water Controls - The liquid polymer preparation system shall include a pressure reducing valve, rotameter, flow-adjusting valve, solenoid valve, and a check-valve for control of dilution water. The rotameter and flow adjusting valve shall be front panel mounted. Dilution water rate shall be adjustable over a 10:1 range.

2.2.3 Secondary Dilution Package - (Optional) Provide a secondary dilution package consisting of a solenoid valve, a rotameter with flow adjusting valve, and a static in-line mixer. All components shall be pre piped by the manufacture and form an integral section of the basic unit.

2.2.4 Dispersion-Injector - Primary polymer activation shall be performed by a dispersion-injector, a small high intensity chamber constructed of a clear synthetic material. Liquid polymer shall be metered directly into the dispersion-injector, where it disperses into a fine conical stream while simultaneously mixing with high intensity flowing water. The output solution from the dispersion-injector shall discharge directly into a static activation chamber where final and complete polymer activation instantaneously occurs.

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The dispersion-injector shall utilize a highly efficient and reliable technique to first disperse and then mix liquid polymer with water; it alone shall produce a near-perfect solution. Its design shall not include any components anywhere within the liquid polymer supply line, and all of its internal areas shall be continuously flushed with rapidly flowing water. The dispersion-injector shall also contain and isolate the liquid polymer whenever the metering pump is not operating or the preparation module itself is shut off. The dispersion-injector shall be self-cleaning.

2.2.5 Static Activation Chamber - The preparation module shall include a low intensity, horizontally-mounted, static activation chamber as the second and final stage of the polymer activation process. The activation chamber shall be designed without any moving parts. Solution discharging from the dispersion-injector shall immediately enter the activation chamber, passing across and through mixing media in a swirling flow pattern to produce an effective mixing action for complete and thorough polymer activation. The cylindrical section of the static activation chamber shall be constructed of a clear synthetic material to allow visual observation of its internal areas.

The two-stage activation system (the combination of the dispersion-injector and static activation chamber) shall assure gentle handling of liquid polymer without in any way exposing the fragile, elongated polymer chains to damaging energy. In addition, polymer short circuiting and/or under-processed or over-processed polymer shall not occur. The static activation chamber shall be rated for 100 PSIG, constructed of 316 stainless steel and synthetic materials and shall also be self-cleaning and maintenance-free.

2.2.6 Differential Pressure Switch - A differential pressure switch shall be included within the system and wired to the control panel to automatically de-energize the system should a back-flow condition occur.

2.2.7 Pressure Gauges - Pressure gauges shall be included for both inlet and discharge pressure readings.

2.2.8 Drum Suction Assembly - A drum suction assembly, consisting of a rigid PVC tube with a foot valve and flexible tubing, shall be provided. The assembly shall allow for complete evacuation of a standard 55 gallon drum of polymer.

2.2.9 Graduated Cylinder - (Optional) A graduated cylinder shall be provided (shipped loose) for pump calibration.

2.2.10 Floor Stand - (Optional) A floor stand shall be provided to elevate the module to a convenient height and to allow a standard 55 gallon drum to be placed directly beneath to provide a clean, compact installation.

The floor stand shall be fabricated with minimum 2" square carbon steel tubing legs.

2.2.11 Wall Shelf - (Optional) A wall shelf, fabricated of mild steel, shall be provided for the system to elevate the unit to a convenient height.

2.2.12 Holding Tank - A holding tank having a capacity of _____ gallons shall be provided. The tank shall be constructed of 11 gauge, 304 stainless steel and include a (full) cover on which shall be installed high and low level conductance probes and a slow speed mixer. The mixer shall be designed to provide proper mixing at speeds not exceeding 350 RPM. Plastic or fiberglass tanks will not be acceptable.

The level probes shall be manufactured of 3/8 inch, 316 stainless steel rods secured by a stainless steel housing. Any level probe longer than 60 inches shall be supported by a stainless steel support leg fixed to the stainless steel housing.

The holding tank shall be rectangular.

2.2.13 Mixer - The holding tank shall be complete with a _____ HP mixer. The mixer impeller speed shall not exceed 400 RPM and the impeller shall be positioned no less than one and one half impeller diameters from the bottom of the tank. The mixer assembly shall include an angle riser support, right angle helical gear-reducer and a TEFC motor. The impeller and shaft shall be 316 stainless steel. The unit shall be designed for heavy-duty operation at varying tank levels. The mixer shaft diameter shall be 7/8 inch minimum.

2.2.14 Surface preparation of carbon steel components shall be by power tool cleaning in accordance with SSPCSP363 followed by two coats of epoxy primer equal to Sherwin Williams B67H5, and one coat of Sherwin Williams H61L19 dark blue enamel finish.

2.3 Controls

2.3.1 Control Panel - A NEMA 4X control panel shall be factory mounted and wired as an integral part of the system. The control panel shall include local/off/remote stop-start control for a dry contact.

In the event of a low differential pressure condition, logic shall be provided to allow the operator to select either a pause in pump operation or a complete system shutdown requiring a restart to resume operation.

Separate dry contact outputs shall be provided to indicate system operating and general alarm.

Indicator lights shall be provided for power on as well as for an alarm condition. The alarm circuitry shall include low differential pressure and activation chamber overload.

The panel shall utilize 115 volt, 60 Hertz, single phase power.

2.3.2 Holding Tank Control Panel - The holding tank control panel shall be supplied prewired to the tank assembly. The unit shall include level control relays and logic to provide automatic batch recharging operation from the preparation module and a motor starter for the mixer.

Hand/off/auto switches shall be provided for the mixer and preparation unit. The panel shall be NEMA 4 construction and also utilize 115 volt, 60 Hertz, single phase power.

2.4 Schedule of Liquid Polymer Preparation System(s)

2.4.1 Provide a total of ___ polymer systems in accordance with this schedule:

Number of Units	Applications	Metering Pump GPH at maximum PSIG	Dilution water Rotameter GPH

2.5 Quality Assurance

2.5.1 The liquid polymer preparation module (system) and accessories shall be furnished by a single manufacturer who is fully experienced, reputable and qualified in the manufacture of the equipment to be furnished. The equipment shall be designed and constructed in accordance with normally accepted practices and methods.

2.5.2 The liquid polymer preparation module shall be the Model 530 as manufactured by Acrison, Inc., Moonachie, New Jersey.

2.6 Submittals

2.6.1 Copies of all materials required to establish compliance with these specifications shall be submitted for review and approval prior to fabrication of equipment. Submittals shall include at least the following:

1. Shop drawings showing all pertinent details of construction and dimensions.
2. Descriptive literature, bulletins and catalogs of the equipment.
3. The total weight of the equipment.
4. Drawings of the control panels and wiring schematics to illustrate the equipment to be supplied.

2.7 Operation and Maintenance Manuals

2.7.1 _____ copies of operation and maintenance manuals shall be delivered to the owner prior to startup of the equipment.

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