Bulletin 500

Acrison®

Polymair® Model 500

Polyelectrolyte Preparation System

For Dry and Liquid Polymers

Industrial and municipal chemical feed equipment.

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Polymair Model 500 Polyelectrolyte Preparation System

Cuts water and wastewater treatment cost by accurate metering, positive dispersion, and complete wetting of dry and liquid polymers.

The Polymair Model 500 Polyelectrolyte Preparation System automatically and efficiently prepares a homogeneous and precise solution from either dry or liquid polymers.

Although usually furnished to handle only a dry polymer, the system can be arranged to also handle liquid polymers. To accomplish this, a dry feeder and liquid polymer metering pump are included. Manual selection provides automatic transfer from a dry to liquid or a liquid to dry system.

The Model 500 Polymer Preparation System is completely assembled and mounted onto a "skid" type base. An aging tank, when furnished, is shipped separately.

Features	Benefits
Model 105Z Volumetric Feeder	Dissimilar Speed, Double Concentric Auger Metering Mechanism ensures positive, accurate and reliable feed of dry polymer to the wetting chamber.
Convenient Polymer Filling Height	Floor-level feeder facilitates operator loading of hopper.
Wetting Chamber - Swirling Water Vortex	Ensures complete and thorough wetting without any agglomeration or "fisheyes".
Wetting Chamber - No Moving Parts	Maintenance-free operation.
Polymer Atomizer	Provides positive dispersion of polymer particles, exposing maximum particle surface area, ensuring complete wetting without agglomeration or fisheyes.
Air Dryer	Regenerative desiccant dryer ensures that only dry air is used to atomize the hygroscopic polymer.
Exhaust Blower	Evacuates conveying air from system, while providing a positive downdraft at the inlet of the wetting chamber.
Air Scrubber	Utilizes a unique water flooded demister system to completely filter and clean all air leaving the mix tank.
Water Pressure Switch	Prevents system operation should the water pressure drop.
Flow Meter	Provides visual indication of water volume flowing through the Model 500 System.
Hopper Low Level Probe	Warns the operator when polymer supply is low.
Mix and Age Tanks Sized Based on Application	Customized systems allow for greater flexibility, especially in rooms with height or footprint limitations.
Rugged Tank Construction	Stainless steel tanks (11 gauge) ensure extended life and durability.
Completely Enclosed Tanks	Prevents items and debris from falling in, and prevents solution from splashing out.
Slow Speed Mixer	Gently mixes polymer solution without damaging the fragile polymer chains.
Liquid Polymer Pump Assembly	Optional for the accurate metering and blending of neat liquid polymer.
Control Panel	Allen-Bradley PLC based panel provides complete automatic control of the system with the latest technology.
Model 500 System - Compact Design	Minimizes floor space and headroom requirements.
Superior Atomizing/Wetting Design	Ability to properly wet even the toughest polymers (super-fine, flaky, etc.).
High Polymer Wetting Rate	System is suitable for extremely large and demanding applications.
Various Feeder Hopper Sizes and Hopper Loading Devices Available	Bulk bag (super-sac) unloaders, extra-large hoppers, dust collectors with bag dump stations, and more…
Extremely Rugged, Heavy-Duty Design	Increases longevity and decreases maintenance requirements compared to "other" systems.

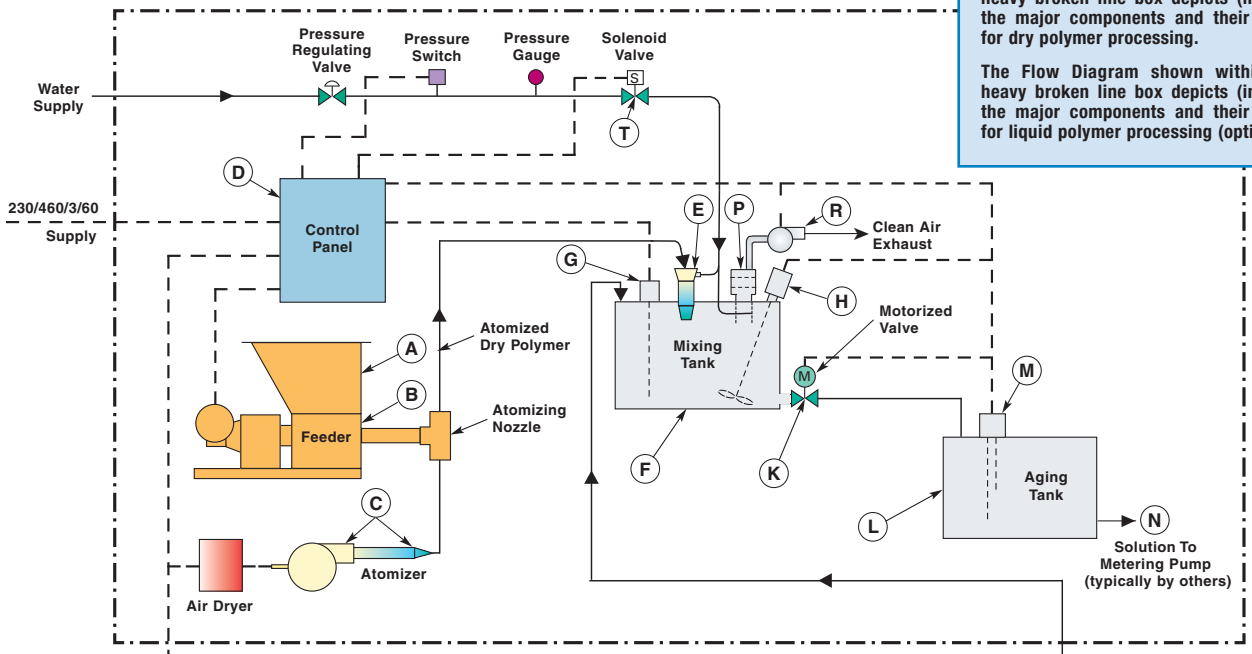
Provides Value to System Functionality/Operation Facilitates Maintenance/Increases Safety Provides System/Application Flexibility

A package Polyelectrolyte Preparation System for the efficient preparation of dry and liquid polymers.

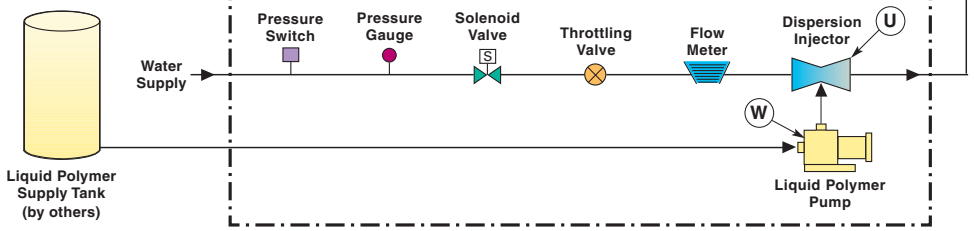
Model 500 System Operation

The Flow Diagram shown within the upper heavy broken line box depicts (in block form) the major components and their arrangement for dry polymer processing.

The Flow Diagram shown within the lower heavy broken line box depicts (in block form) the major components and their arrangement for liquid polymer processing (optional).



Model 500 System



Liquid Polymer Pump Package (optional)

Principle of Operation

Standard Dry Mode

Operation of the Model 500 System can be easily understood by following the above Flow Diagram. Dry polymer is usually manually loaded into Feeder Hopper **(A)** and then accurately metered at a preset rate by Feeder **(B)**. The metered polymer is pneumatically dispersed with dry air by Atomizer **(C)** and simultaneously conveyed into Cyclone Wetting Chamber **(E)**. In the wetting chamber, the atomized polymer impinges a continuously flowing water cyclone, where it is efficiently and thoroughly wetted without any clumping or agglomeration.

The completely wetted polymer then drops into Mixing Tank **(F)** where a slow speed Mechanical Mixer **(H)** facilitates dissolving (into solution) without damaging the polymer chains. Exhaust Blower **(R)** of Air Scrubber **(P)** assures a positive downdraft at the inlet of Wetting Chamber **(E)**, preventing even the smallest atomized particles from escaping. Only clean air is returned into the atmosphere. Level Probe **(G)** automatically closes Solenoid Valve **(T)** at high level and also, opens Solenoid Valve **(T)** at low level. Level Probe **(G)** also closes Transfer Valve **(K)** when Mixing Tank **(F)** is empty. The Demand Level Probe **(M)** opens Transfer Valve **(K)** to ensure a continuous supply of polymer solution to Aging Tank **(L)** which is sized to provide sufficient time for full elongation of the polymer. Aged polymer is then fed to the process at the desired rate by Metering Pump **(N)**.

Optional Liquid Mode

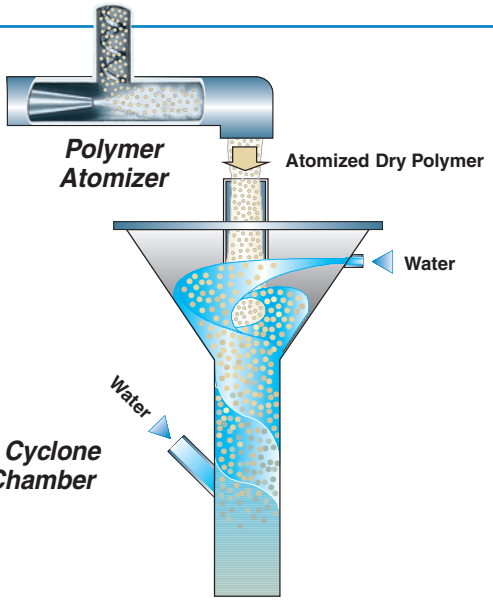
Should it be desirous to arrange the Polymair 500 System to handle either dry or liquid (emulsion) polymers, the same basic arrangement, as described, is utilized. To accommodate this provision, a switch is provided in the control panel for the selection of dry or liquid polymer, automatically selecting the appropriate hardware. When handling a liquid polymer, the polymer is pumped by Liquid Polymer Pump **(W)** directly into Acrison's unique *'Dispersion-Injector'* **(U)**, where it instantaneously blends with water just prior to entering the Mixing Tank **(F)**.

Cyclone Wetting Chamber

Acrison's Dry Polymer Cyclone Wetting Chamber

Referring to the illustration, swirling water combines with atomized dry polymer (exposing maximum particle surface area) for efficient, complete and thorough wetting.

- Based on original wetting device designed by Acrison in 1974
- Eliminates agglomerate formation
- No restrictive orifices ensures non-clogging operation of wetting chamber
- Constructed of 316 stainless steel
- No moving parts – maintenance-free



Acrison's Cyclone Wetting Chamber

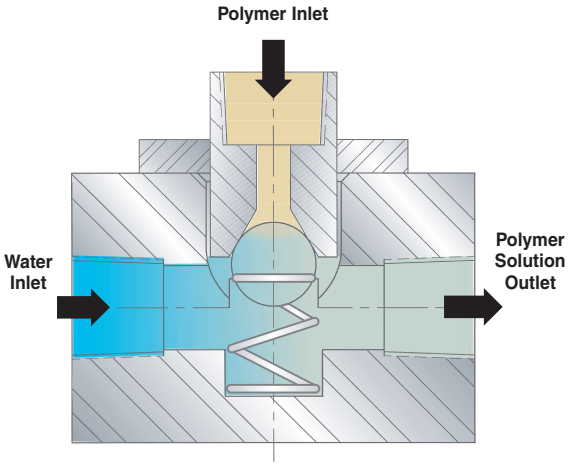
Dispersion-Injector

Acrison's Polymer Dispersion-Injector

– Provided with the optional liquid polymer package –

Referring to the illustration, water flows into the *Dispersion-Injector* from one end. Then, in the central section of the unit, polymer enters in a thin, fine conical stream that instantaneously blends with the vigorously flowing water, exiting the *Dispersion-Injector* as a "pre-blended" solution at the end opposite the water inlet. In addition, liquid polymer is completely isolated from contact with water anytime the polymer pump is off or the Preparation Module is shut-down.

- Highly efficient solution preparation reduces long-term polymer use
- Full polymer activation
- Self-cleaning and non-clogging
- Polymer isolated from water during shutdown
- Clear synthetic housing allows visual observation of process
- Corrosion-proof
- Low-maintenance
- Reliable rugged design



Acrison's Dispersion-Injector

Custom designed Polymair 500 System for a large wastewater treatment plant.

Polymair Model 500 Polyelectrolyte Preparation System

Basic Specifications

- **Dry Polymer Feeder:** An Acrison Model 105 Series, dissimilar speed, Double Concentric Auger Volumetric Feeder, accurately meters dry polymer. The standard feeder hopper capacity is two cubic feet with a low filling height. The feeder is entirely dust-tight; all product contact surfaces are 304 stainless steel in construction.

  Metering accuracy is usually within ± 1 to 2 percent (error) or better based on a given number of consecutive one minute weighments.

- **Atomizing System:** The Atomizing System atomizes (disperses) the metered dry polymer as it discharges from the feeder, exposing maximum particle surface area, and conveys the polymer into the cyclone wetting chamber. As standard, all components of the Atomizing System are 304 stainless steel in construction (excluding the Air Dryer).

- **Cyclone Wetting Chamber:** Within the Cyclone Wetting Chamber, a highly effective and efficient wetting action occurs when the atomized dry polymer comes into contact with a swirling, turbulent water cyclone; thorough wetting is achieved without "fisheyes". The Wetting Chamber is located above the mixing tank, away from the dry polymer feeder. As standard, the Cyclone Wetting Chamber is 316 stainless steel in construction (excluding the Air Dryer).

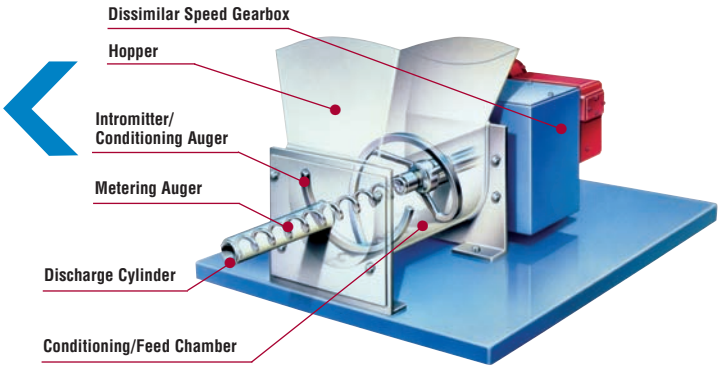
- **Air Scrubber:** The Air Scrubber eliminates any possible pressurization within the mixing tank and ensures that only clean air is evacuated. The Scrubber utilizes a unique water-flooded demister system that effectively and efficiently filters all of the air exiting the mixing tank. As standard, the Air Scrubber is 304 stainless steel in construction.

- **Air Dryer:** The Air Dryer, designed with a regenerative desiccant dryer system, ensures that only dry air is used to atomize the hygroscopic polymer.

- **Mixing Tank:** The Mixing Tank receives the wetted polymer for mixing prior to being transferred to the aging tank. The Mixing Tank includes a slow speed mechanical mixer to facilitate the mixing process without damaging the polymer chains. As standard, the Mixing Tank is 304 stainless steel in construction.

- **Aging Tank:** The Aging Tank is designed and sized to provide suitable aging time to ensure maximum activation of the polymer solution. As standard, the Aging Tank is 304 stainless steel in construction.

- **Enclosed Design:** The design of the Model 500 Polymer Preparation System ensures that the hygroscopic polymer is maintained completely dry and contained to avoid any absorption of moisture.



Model 105 Series Volumetric Feeder

- **Control System:** The Model 500 Polymer Preparation System is operated by an Allen-Bradley PLC with a 10 inch color touch screen operator interface, and includes Ethernet capability as standard. The PLC provides complete control of system operation, and run/alarm indication of all system components through an operator-friendly platform. All components of the basic system are prewired at the factory. It is only necessary to connect power and water to the system. All motors are totally enclosed.

- **Transfer Valve:** The mixing tank is equipped with a suitably sized, fast-acting motorized Transfer Valve to reduce the time it takes to empty the tank, thereby allowing the completion of more batches within a given period of time. The Transfer Valve is 316 stainless steel in construction, and includes a manual override.

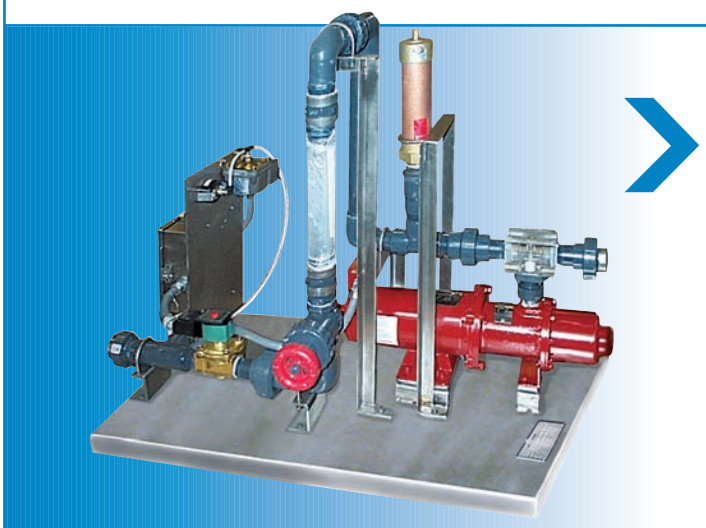
- **Water Pressure Switch:** The Model 500 System is equipped with a Water Pressure Switch that will prevent the system from operating should the water pressure drop below a specific value.

- **Hopper Low Level Probe:** The dry polymer feeder is equipped with a Low Level Probe to indicate when the supply of dry polymer within the feeder's hopper is low.

- **Bag Loading Hopper:** As an option, the dry polymer feeder is available with a Bag Loading Hopper that will eliminate dust when loading the feeder's hopper.

- **Construction:** As standard, all product contact surfaces are stainless steel.

- **Power requirements:** 230/460/3/60.



Optional Equipment

- **Liquid Polymer Blending Package –** allows for the use of liquid emulsion type polymers. The package uses Acrison's unique *Dispersion-Injector* to blend liquid polymer with water prior to discharge into the mixing tank.

- **Polymer Solution Metering Pump –** furnished as a separate item, the pump receives prepared solution from the aging tank. Post-dilution accessories can also be provided.

- **Ultrasonic Level Transmitters –** used in place of the standard conductance type level probes on the mixing and aging tanks, the ultrasonic transmitters provide non-contacting operation, changeable set-points, and continuous level measurement.

- **Hopper Loading Equipment –** A bulk bag unloader, hopper mounted dust collector and single door hopper bag loader are available for dust free loading of the feeder hopper .

Discover the difference!

We cordially invite you to witness a test in Acrison's state-of-the-art Customer Demonstration Facilities handling your actual product(s) with the specific equipment we recommend for the application. Usually, there is no cost or obligation for this service.

Discover the difference in technology, quality and performance of Acrison equipment.

Acrison products...

- Models 101 and 130 Volumetric Feeders
- Models V101 and V130 Volumetric Feeders
- Model 1015 Volumetric Feeder Series
- Model 105 Volumetric Feeder Series
- Model W105 Volumetric Feeder Series
- Model 120 Volumetric Feeder
- Model 140 Volumetric Feeder Series
- Model 170 Volumetric Feeder Series
- Bin Discharger Feeders
- Model 200 Series of Weigh Belt Feeders
- Model 203B Series of Weigh Auger Feeders
- Model 270 Series of In-Line Weigh Feeders
- Models 402, 404, A405, 406 and 407 Series ("Weight-Loss-Differential") Weigh Feeders
- Model Series 403 ("Weight-Loss-Differential") Weigh Feeders
- Model 403B(D) Batch/Dump Weighing Systems
- Model 404BZ(BU) Bulk Bag Unloader Batch Weigher
- Models 350 and 301 Continuous Blenders and Blending Systems
- Multiple Auger Bin Dischargers and Multiple Auger Bin Discharger Hoppering Systems
- Vibratory Bin Dischargers
- Model 500 Series of Polyelectrolyte Preparation Systems
- Water and Waste Water Treatment Systems
- Volumetric and Gravimetric Feeder Controllers and Control Systems
- Accessory Equipment for Acrison Products
- Systems Engineering

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Manchester, UK

Joseph Street Facility
Moonachie, NJ USA

"Visibly Different... Measurably Better"

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