

Ultromat® Polymer Preparation Systems

ProMinent offers dry and liquid polymer makedown systems for nearly any flocculation or dewatering process.

Selection of a dry or liquid polymer system must consider polymer performance specific to the application, as well as initial capital costs and life cycle costs. While dry polymer systems generally have a higher initial cost, their life cycle costs are usually lower because the cost of dry polymer is generally less than that of liquid. Dry polymer is 100% active, while liquids, pre-blended with water or hydrocarbon oil (emulsion polymer), may be only 20% active and result in higher transportation costs.

Selection of an automatic continuous system vs. a manual batch system depends on the type of service required. For example, continuous preparation and feed is appropriate for 24-hour-a-day operations (e.g. municipal water treatment) while batch preparation is more suited to applications such as a one-shift sludge dewatering filter press. Because polymer degrades over time, only as much as is needed in a day should be prepared in a batch plant.

The number of compartments in a polymer system refers to the mixing, aging, and storage capability. ProMinent offers single tanks (for batches of dry polymer), two-compartment (for liquid polymer) and three-compartment (for dry or liquid polymer) systems. All of the automatic systems are designed for one-hour retention from initial mixing to discharge. Also offered, is the portable P-series system for liquid polymer.



ProMinent®

ProMinent Polymer Feed Systems

	<u>CONTINUOUS OPERATION</u>	<u>BATCH</u>
DRY POLYMER	Type AT/96 (three-compartment)	Type MT (one tank: manual polymer addition)
LIQUID POLYMER	Type AF/96 (two-compartment) P-Series (age tank optional)	
DRY/LIQUID POLYMER	Type ATF/96 (three-compartment)	

Polymer concentration is set via calibration of the dry feed rate and dilution water flow rate. The concentration can be adjusted from 0.05% to 1.0% simply by programming the desired value into the Ultromat controller. Concentration based on water flow rate is defined as:

$$\text{Concentration} = C (\%) = \frac{\text{lbs/h dry polymer}}{\text{lbs/h water}} \times 100\% \quad \text{OR} = \frac{\text{Kg/h dry polymer}}{\text{Kg water}} \times 100\%$$

Sizing Example: A wastewater treatment plant needs to add 25 ppm of a 0.3% solution to treat 52,800 gph (200,000 L/h) of waste water.

$$F = 52,800 \text{ gph (200,000 L/h)} \quad D = 25 \text{ ppm} \quad C = 0.3\%$$

First, determine the feed rate of dry polymer required:

$$P = F \times D \times 10^{-6} = 11 \text{ lbs/h (5 kg/h)} \quad (10^{-6} \text{ kg} = 1 \text{ mg})$$

Then determine the required feed rate of prepared polymer solution:

$$S = P/C \times 100\% = 3,667 \text{ lbs/h (1,667 kg/h)}$$

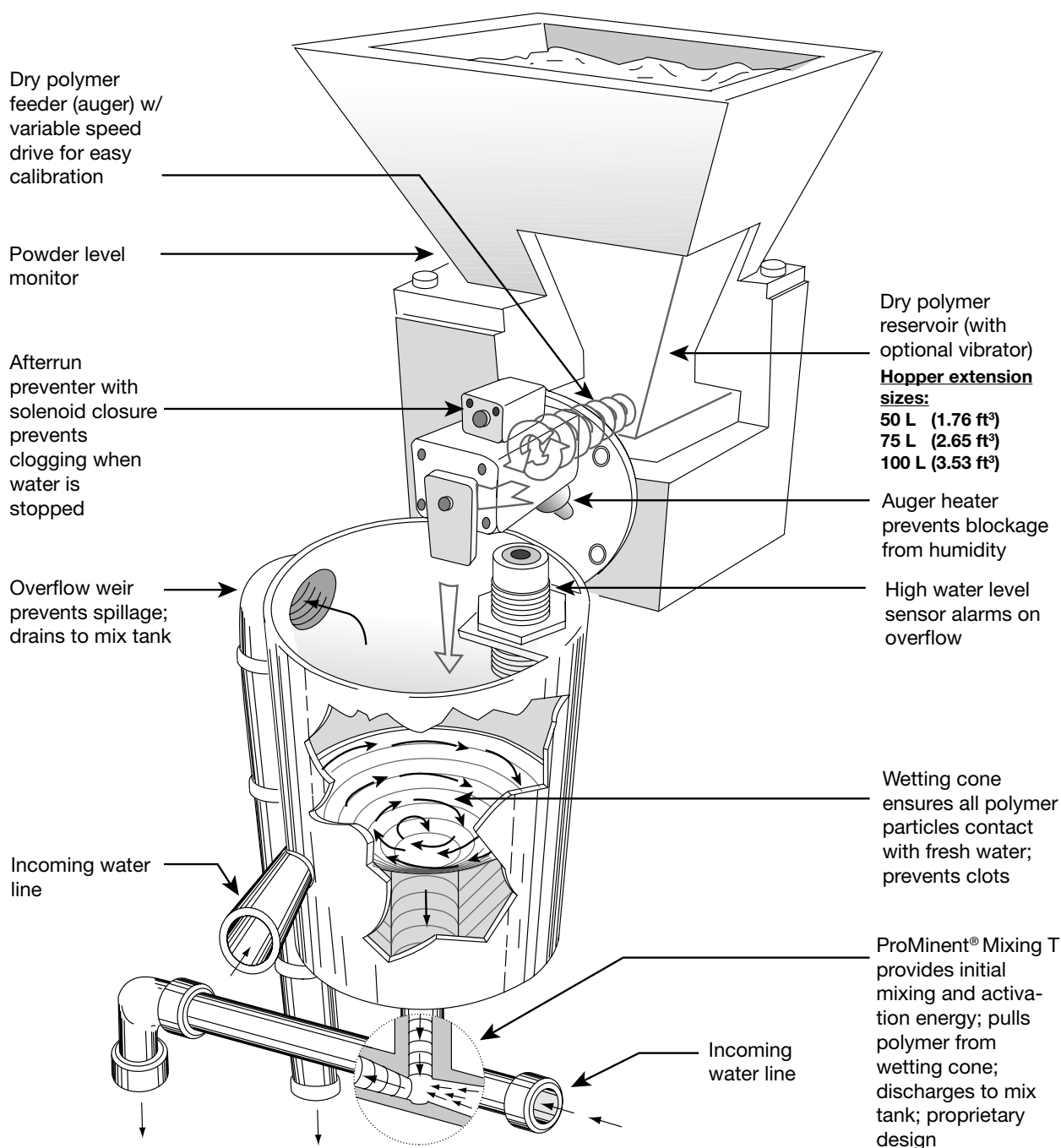
Note: for a polymer solution of specific gravity = 1, kg/h equals L/h; S = 1,667 kg/h = 1,667 L/h. (For s.g. different than 1: divide S by the specific gravity of the polymer solution to obtain L/h)

The Ultromat required is an AT-2000: 2000 L/h capacity; dry feeder: 0.8 to 18.3 kg/h (The AT is a 3-compartment system; also available in 2 compartments systems are the ATD-2000 and ATP-2000)

The Ultromat systems can also be supplied with hoppers, equipment for pneumatic powder feeding from the container (e.g. Big-Bag), secondary dilution systems and dosing stations for the final solutions.

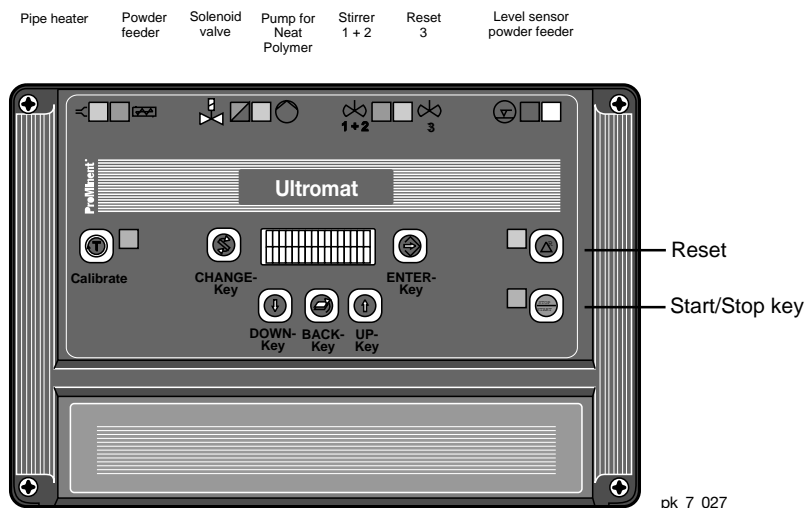
Ultromat® AT/ATF - Dry Polymer Wetting System

Dry Feeder and Wetting Cone



Ultromat® AT-96 and ATF-96

Automatic Three-Compartment Dry Polymer Preparation System

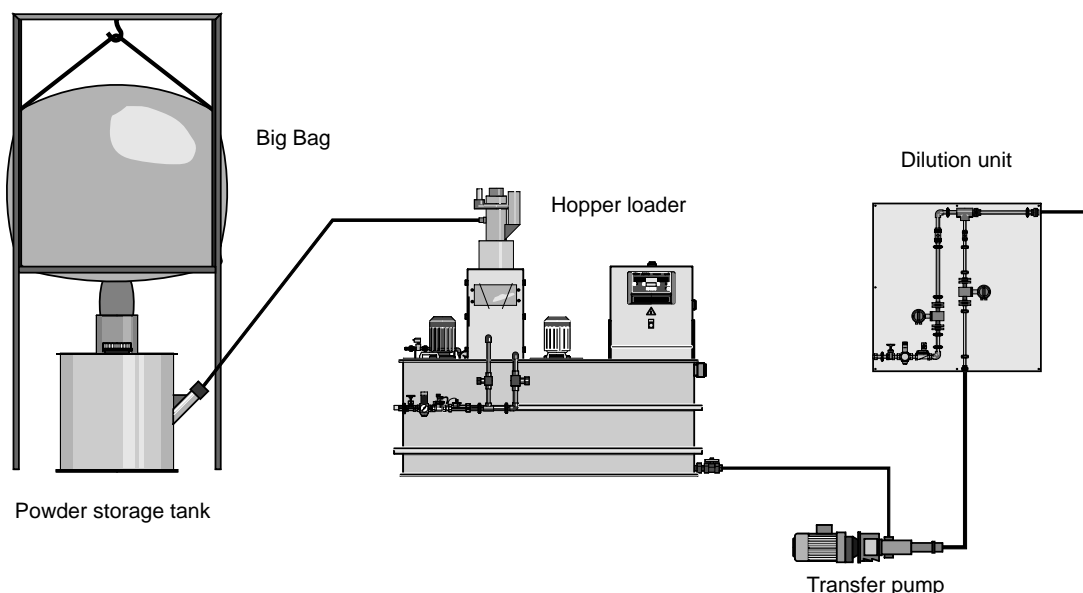


Control Panel

The Ultromat AT/96, ATF/96 and AF/96 systems feature a new menu-driven control panel capable of monitoring and adjusting all polymer metering parameters. Key features include:

- The feed rate of dry or concentrated liquid polymer is automatically proportioned to the water feed flow rate to maintain the desired polymer concentration. Any changes in water feed rate will proportionally increase or decrease the concentrated polymer feed rate. The polymer concentration may be easily changed by programming in a new value from 0.05% to 1.0%.
- The polymer concentration (%) and dilution water flow rate (L/h) are displayed on an LCD screen and status lamps indicate operation of the dry feeder and its pipe heater, feed water solenoid valve, neat polymer pump (on ATF and AF models), mixers, and powder feeder level sensor.
- Adjustable parameters include: polymer concentration; pipe heater on- and off-times; wetting cone pre-rinse time and post-rinse time; mixers 1 & 2 on- and off-times; mixer 3 on- and off-times; neat polymer pump inverter minimum frequency (for ATF and AF liquid polymer models); minimum dilution water flow rate; and access code to prevent unauthorized adjustments.
- Calibration of dry feeder (or liquid polymer pump) and feed water flow rate is simple. In the calibration menu, push the "T" key, which starts the dry feeder (or liquid polymer pump), or feed water. The elapsed time is indicated in the display. Push "T" again to stop the feed, measure the dry (or liquid) polymer discharged (in grams), or neat polymer flow (in litres), enter the value, and the unit is calibrated. (The dilution water flow rate is automatically determined).
- Alarms are generated by: low feedwater flow rate; (or low neat polymer flow) (ATF/AF); mixer malfunction; dry feeder hopper empty; overflow of wetting cone; and others.

Application example for a complete polymer dosing system:



Ultromat® AT/ATF/AF-96 - Dry and Liquid Polymer Preparation Systems

System Configuration and Operation

Dry Feeder

The dry powder hopper has 20 liter (0.7 cubic foot) capacity with a mounting flange for optional extended volume hoppers of 50, 75 or 100 liters (1.76, 2.65 or 3.5 cubic feet). The dry feeder's helix is driven by a variable speed motor which allows precise setting of the dry polymer feed rate into the dilution water for precise polymer concentration from 0.05% to 1.0%.

- Loosening spiral prevents bridging of the dry polymer.
- An adjustable temperature heating element at the feeder discharge prevents moisture from clogging the feeder.
- A solenoid-driven positive closure prevents overrun when the dry feeder is shut off.
- Level sensor in the hopper alarms when powder supply is low.

Polymer Wetting

The dry feeder drops the powdered polymer into the wetting cone. High velocity water entering at the top instantly wets all dry powder particles, eliminating "fish eyes" or clots of unwetted polymer.

As the water swirls around the cone's vortex, the wetted polymer is pulled down to the bottom of the cone by a venturi on the main water line, which provides intense mixing energy with minimal shear. It is then ejected directly at the propeller of a mixer in the first mix tank. A flow meter on the main water line allows accurate proportioning of water and polymer, and shuts down the system with an audible alarm if water flow drops below an adjustable set point.

An adjustable level sensor on the wetting cone, along with an overflow line to the mix tank, prevents accidental overfeed of water into the cone. The incoming water line includes an adjustable pressure regulator and a solenoid

valve to shut down water flow when the storage tank is full, or in the event of a fault or power failure.

The ATF-96 and AF-96 systems use a metering pump to discharge concentrated polymer solution (neat polymer) directly at the mixer blades in the primary mix tank for activation of the polymer. (Metering pump not included).

Mixing, Aging and Storage

The AT/ATF-96 system includes a three-compartment mix, aging and storage tank sized to provide one hour total retention time from wetting to discharge at the Ultromat's rated capacity. The AF-96 liquid polymer system has a two-compartment (mix and aging) tank system. The tank system is made of welded polypropylene sheet to eliminate corrosion common to metallic systems. Baffles separating the compartments allow the polymer solution to flow from the bottom of the upstream compartment over a weir to the top of each downstream compartment to eliminate short circuiting of fresh polymer into cured material.

The slow speed mixer in the mix compartment (first) gently and continuously agitates the solution. The polymer flows to the aging compartment (second), also mixed, then to the storage compartment (third), which maybe periodically mixed with an optional mixer. The polymer solution is dosed directly to the point of use from the storage compartment (AT/ATF-96) or aging compartment (ATP/ATD/AF-96) by a metering pump; *not included with the Ultromat.*

A high level sensor in the storage compartment stops the entire system when supply exceeds the amount removed by the metering pump, and a low-level sensor automatically restarts the system

when needed. An overflow pipe, plumbed to drain, prevents spillage in the event of level switch failure. Each compartment is valved for draining and cleaning, or may be manifolded to the metering pump for complete utilization of polymer if the system is used periodically instead of continuously.

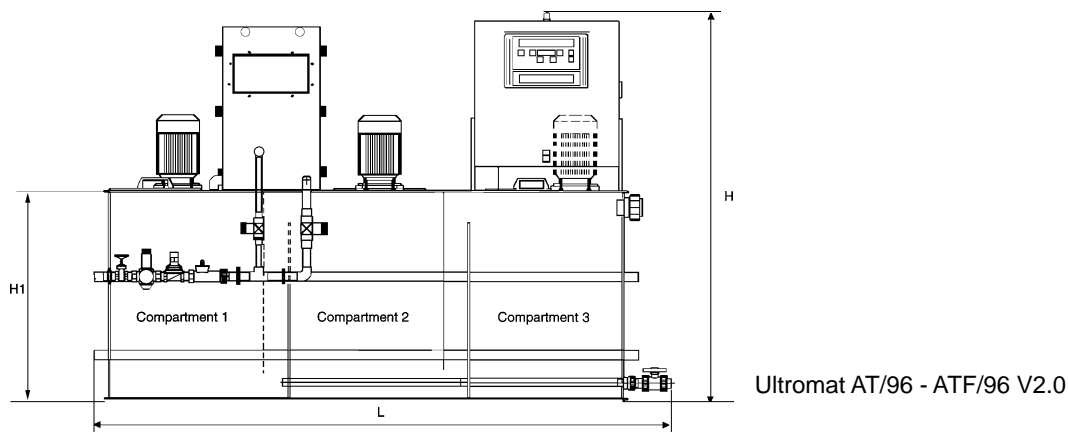
Ultromat® AT-96 and ATF-96

Automatic Three-Compartment Dry or Liquid Polymer Preparation System 106 to 2,115 gph (400 to 8,000 L/h)

Ready-to-operate, three-compartment preparation system for powder polymer to a 0.05 to 1.0 percent solution.

- 1 Baffled, three-compartment tank: aging and storage tank of welded polypropylene or stainless steel
- 1 Dry feeder and hopper with feeder discharge heating and automatic afterrun preventer, driven by means of an adjustable speed motor
- 1 Dispersing system for dispersing and wetting the powder, with wetting cone, eductor, flow meter and valve set for the dissolving water
- 3 Electric mixers
- 1 Control panel for the automatic control of the complete system
- 1 Remote on/off with feedback signal. Operating signal is transmitted via a voltage free contact.
Contact closed: plant is operating/no malfunctions. Contact open: plant was stopped/malfunction
- 1 Overflow sensor alarm
- 4 Lifting lugs. For moving Ultromat with overhead crane (spreading bars are required)

Note: Polymer metering pump not included with Ultromat system



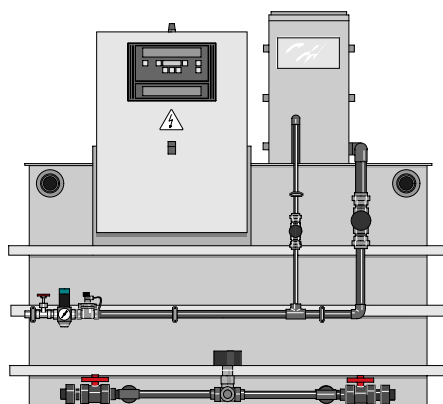
Capacities and Dimensions

Ultromat® AT/ATF	Type	400	1000	2000	4000	8000
Performance data:						
Max. Polymer Output	US gph (L/h)	106 (400)	264 (1000)	528 (2000)	1057 (4000)	2113 (8000)
Max. Feed Water Flow Rate	US gph (L/h)	396 (1500)	396 (1500)	793 (3000)	1585 (6000)	3170 (12000)
Tank Volume	US gal. (L)	106 (400)	264 (1000)	528 (2000)	1057 (4000)	2114 (8000)
Dilution Water Pressure	psig (bar)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)
Dry Feeder Output (min-max)	cubic ft/h	0.05-1.02	0.05-1.02	0.05-1.02	0.21-4.66	0.42-8.86
	(L/h)	(1.3-29)	(1.3-29)	(1.3-29)	(6-132)	(12-264)
	lbs/h (at 37.4 lbs/ft. ³)	1.7-38.3	1.7-38.3	1.7-38.3	7.9-174.5	15.8-349.1
	Kg/h (at 0.6 Kg/L)	0.8-18.3	0.8-18.3	0.8-18.3	3.6-82	7.2-167
Dimensions:						
Length (L)	in (mm)	69.7 (1770)	94.9 (2410)	120.9 (3070)	125.2 (3181)	174.6 (4434)
Width (W)	in (mm)	36.0 (915)	37.4 (950)	42.9 (1090)	59.9 (1521)	75.2 (1910)
Height (H) (top of control panel)	in (mm)	49.2 (1250)	63.2 (1605)	69.1 (1755)	89.1 (2263)	92.5 (2350)
Height (H ₁) (top of tank)	in (mm)	20.3 (516)	34.1 (866)	40.0 (1016)	59.7 (1516)	59.8 (1518)
Water connection	in (DN)	1 (25)	1 (25)	1 (25)	1-1/2 (40)	2 (50)
Overflow connection	in (DN)	1-1/2 (40)	2 (50)	2 (50)	2 (50)	2-1/2 (65)
Polymer discharge (to pump)	in (DN)	1 (25)	1 (25)	1-1/4 (32)	1-1/2 (40)	2 (50)
Power requirements:						
230V, 3 phase, 50/60 Hz	HP (kW)	2 (1.5)	3.5 (2.6)	4.3 (3.2)	6.7 (5.0)	12.7 (9.5)

As system requirements are produced individually according to application, we will inform you of prices on enquiry.
We reserve the right to change components and their construction, as long as these do not affect their performance or function.

Ultromat® Polyelectrolyte Preparation and Dosing System for Organic Flocculants

Ultromat® ATP 2 Compartment Dry Polymer Makedown System
106 to 1,057 gph (400 to 4000 L/h)



pk_7_015

Turnkey automatic two compartment system for powdered flocculants with all the components required for the preparation of a 0.05 to 1.0% concentration dosing solution.

Ultromat® ATP: two compartment system with rectangular two compartment tank (side by side).

System consists of the following parts:

- 2 PP reinforced tanks with mounting for the other units (SS Optional)
- 1 Dry feeder with feeder discharge heating and automatic afterrun preventer, powder level sensor and powder hopper with push fit cover. Driven via a three phase DC gear motor
- 1 Dispersing system for dispersing and wetting the powder, with wetting cone, eductor, flow monitor, flow meter and valve set for dissolving water. With changeover device.
- 1 Set of changeover valves for filling and discharge
- 2 Electric mixers
- 1 Control cabinet for the automatic control of the complete system
- 1 Remote on/off with feedback signal. Operating signal is transmitted via a voltage free contact. Contact closed: plant is operating/no malfunctions. Contact open: plant was stopped/malfunction
- 1 Overflow sensor alarm
- 4 Lifting lugs. For moving Ultromat with overhead crane (spreading bars are required)

Capacities and Dimensions

Ultromat® ATP	Type	400*	1000	2000	4000
Capacity data:					
Batch quantity	US gal (L/h)	106 (400)	264 (1000)	116 (2000)	528 (4000)
Water for dilution	US gal (L/h)	423 (1600)	1057 (4000)	2113 (8000)	3698 (14000)
Dilution water pressure	psig (bar)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)
Powder feed quantity	US gal (L/h)	0.3-7.7 (1.3-29)	0.3-7.7 (1.3-29)	1.6-34.9 (6-132)	3.3-69.7 (12-264)
Power requirements:					
230 V, 3 phase, 50/60 Hz	HP (kw)	3.4 (2.5)	4.3 (3.2)	7.4 (5.5)	9.4 (7.0)
Dimensions, ATP:					
Length	in (mm)	75 (1900)	102 (2600)	126 (3200)	173 (4400)
Width	in (mm)	49 (1250)	67 (1700)	75 (1900)	90 (2291)
Height (without additional structures)	in (mm)	70 (1786)	75 (1900)	90 (2276)	97 (2460)
Water connection	in	1	1.25	1.5	2
Drain/metering connection	DN	25	32	40	50

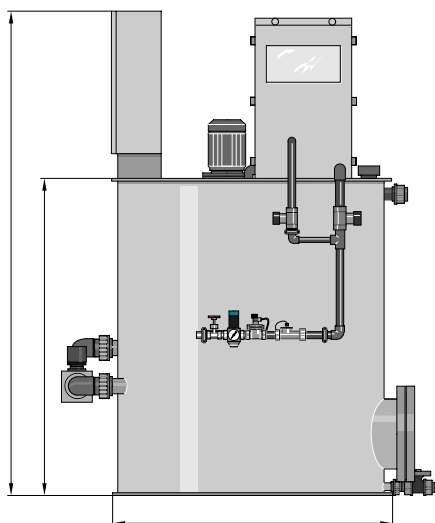
The system can also be supplied with feed hoppers, loosening wheels, level sensors, equipment for pneumatic feed of powder straight from the supply drum (e.g. Big-Bag), diluting systems, wetting systems, dosing monitors and dosing pumps for the prepared solutions.

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Ultromat® Polyelectrolyte Preparation and Dosing System for Organic Flocculants

Ultromat® ATD 2 Compartment Dry Polymer Makedown System
106 to 1,057 gph (400 to 4000 L/h)

ProMinent®



pk_7_016

Turnkey automatic two compartment system for powdered flocculants with all the components required for the preparation of a 0.05 to 1.0% concentration dosing solution.

Ultromat® ATD: two compartment dual level system with upper preparation and maturing compartment and lower cylindrical storage compartment.

System consists of the following parts:

- 2 PP reinforced tanks with mounting for the other units
- 1 Dry feeder with feeder discharge heating and automatic afterrun preventer, powder level sensor and powder hopper with push fit cover. Driven via a three phase DC gear motor
- 1 Dispersing system for dispersing and wetting the powder, with wetting cone, eductor, flow monitor, flow meter and valve set for dissolving water
- 1 Set of changeover valves for filling and discharge and/or for emptying the preparation and maturing compartment into the storage tank
- 1 Electric mixer
- 1 Control cabinet for the automatic control of the complete system
- 1 Remote on/off with feedback signal. Operating signal is transmitted via a voltage free contact. Contact closed: plant is operating/ no malfunctions. Contact open: plant was stopped/malfunction
- 1 Overflow sensor alarm
- 4 Lifting lugs. For moving Ultromat with overhead crane (spreading bars are required)

Capacities and Dimensions

Ultromat® ATD	Type	400	1000	2000	4000
Capacity data:					
Batch quantity	US gal (L/h)	106 (400)	264 (1000)	116 (2000)	528 (4000)
Water for dilution	US gal (L/h)	423 (1600)	1057 (4000)	2113 (8000)	3698 (14000)
Dilution water pressure	psig (bar)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)
Powder feed quantity	US gal (L/h)	0.3-4.8 (1-18)	0.3-4.8 (1-18)	1-21.7 (4-82)	2.1-43.3 (8-164)
Power requirements:					
230 V, 3 phase, 50/60 Hz	HP (kw)	2 (1.5)	3.5 (2.6)	4.3 (3.2)	6.7(5.0)
Dimensions, ATD:					
Diameter	in (mm)	43 (1100)	55 (1400)	71 (1800)	98 (2500)
Container Height (without additional structures)	in (mm)	51 (1300)	59 (1500)	67 (1700)	71 (1800)
Total Height	in (mm)	81 (2050)	106 (2700)	118 (3000)	126 (3200)
Water connection	in	1	1.25	1.5	2
Drain/metering connection	DN	25	32	40	50

The system can also be supplied with feed hoppers, loosening wheels, level sensors, equipment for pneumatic feed of powder straight from the supply drum (e.g. Big-Bag), diluting systems, wetting systems, dosing monitors and dosing pumps for the prepared solutions.

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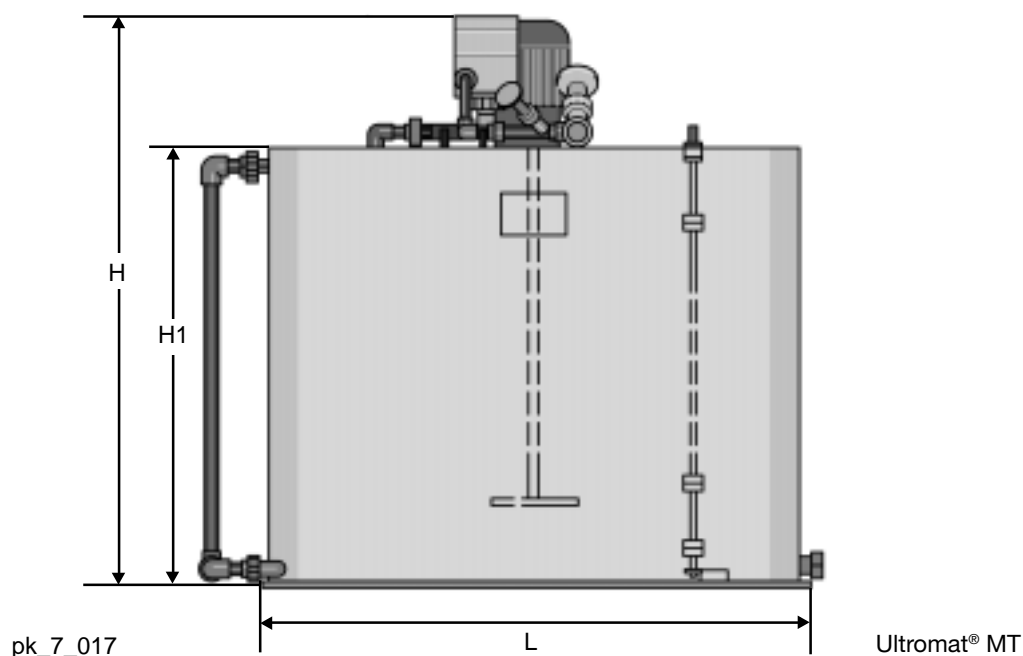
Ultromat® MT

Batch Operation, Dry Polymer, One-compartment Makedown Systems 32 to 1,268 gallons per batch (121 to 4,800 liters per batch)

For batch operation with manual preparation of powder products. These systems are used if no continuous operation is necessary; after the maturity time, the system can be metered. The system consists of:

- 1 Combined PP preparation/maturing/storage tank with reinforcements and brackets for mounting the other system components
- 1 Dispensing system for dispensing and wetting the powder, with dispensing funnel, eductor and valve set for the dissolving water
- 1 Electric mixer
- 1 Float switch with three switching points

Note: Level indicator shown is optional.



Capacities and Dimensions

Ultromat® MT	Type	140	250	500	1000	2000	3000	4000	5000
Performance data:									
Batch quantity	US gal (L)	32 (120)	55 (210)	116 (440)	243 (920)	499 (1890)	753 (2850)	1004 (3800)	1268 (4800)
Lbs. dry polymer/batch at 0.5% solution	lbs. (kg)	1.3 (0.6)	2.3 (1.05)	4.8 (2.2)	10.1 (4.6)	20.8 (9.45)	31.4 (14.25)	41.8 (19.0)	52.9 (24.0)
Dimensions:									
Length	in (mm)	25 (640)	25 (640)	33 (850)	49 (1250)	57 (1450)	69 (1750)	65 (1650)	65 (1650)
Tank height	in (mm)	28 (700)	43 (1100)	39 (1000)	39 (1000)	59 (1500)	63 (1600)	81 (2050)	100 (2550)
Total height	in (mm)	40 (1020)	56 (1410)	51 (1300)	53 (1340)	72 (1840)	79 (2000)	94 (2400)	114 (2900)
Drain nozzle for the metering fluid	in (DN)	3/4 (20)	3/4 (20)	3/4 (20)	1 (25)	1-1/4 (32)	1-1/2 (40)	1-1/2 (40)	2 (50)
Dissolving water connector	in (DN)	3/4 (20)	3/4 (20)	3/4 (20)	1 (25)	1-1/4 (32)	1-1/2 (40)	1-1/2 (40)	1-1/2 (40)
Mixer:									
Power requirements:									
230 V, 3 ph, 50/60 Hz	HP (kw)	0.5 (0.37)	0.5 (0.37)	0.75 (0.55)	1.0 (0.75)	2.0 (1.5)	3.0 (2.2)	4.0 (3.0)	4.0 (3.0)

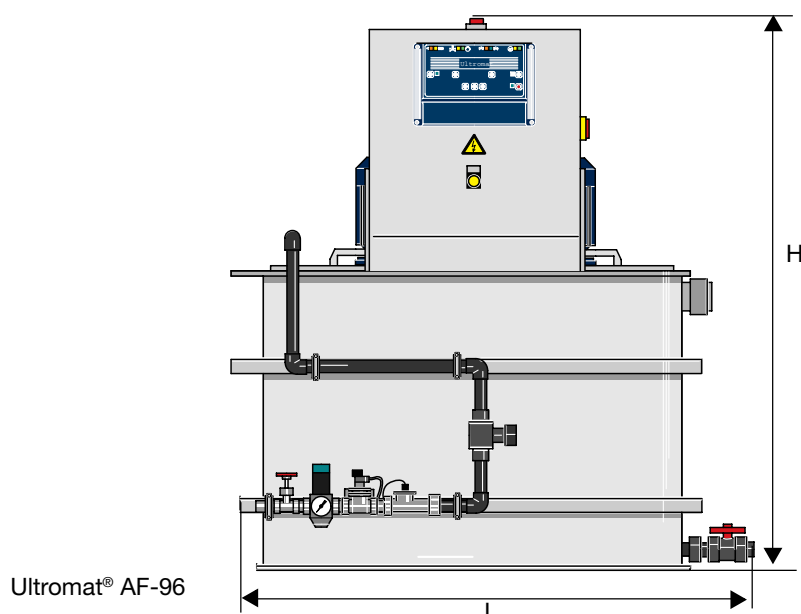
Ultromat® AF-96

Continuous Operation, Liquid Polymer, Two-Compartment Makedown Systems 106 to 2,113 gph (400 to 8000 L/h)

Ready to operate, two-compartment preparation system for liquid polymers equipped with all parts necessary for preparing the polymer solution, consisting of:

- 1 Combined maturing and storage tank with reinforcements and brackets for mounting the metering pumps (PP or SS)
- 1 Dilution system with valve set and flow meter for dilution water
- 2 Electric mixers
- 1 Level switch with three switching points
- 1 Control cabinet for the automatic control of the complete system
- 1 Remote on/off with feedback signal. Operating signal is transmitted via a voltage free contact
Contact closed: plant is operating/no malfunctions. Contact open: plant was stopped/malfunction
- 1 Overflow sensor alarm
- 4 Lifting lugs. For moving Ultromat with overhead crane (spreading bars are required)

Neat polymer metering pump and dilute polymer metering pump not included with system.



Capacities and Dimensions

Ultromat® AF	Type	400	1000	2000	4000	8000
Performance data:						
Treatment quantity	US gph (L/h)	106 (400)	264 (1000)	528 (2000)	1057 (4000)	2113 (8000)
Dilution water	US gph (L/h)	396 (1500)	396 (1500)	792 (3000)	1585 (6000)	3170 (12000)
Dilution water pressure	psig (bar)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)	43.5-72.5 (3-5)
Dimensions:						
Length	in (mm)	51 (1285)	96 (2448)	124 (3160)	125 (3180)	169 (4300)
Width	in (mm)	37 (950)	40 (1011)	46 (1175)	60 (1520)	79 (2000)
Height	in (mm)	56 (1418)	63 (1602)	69 (1755)	79 (2015)	79 (2000)
Water connection	in (DN)	1 (25)	1 (25)	1 (32)	1-1/2 (40)	2 (50)
Polymer discharge	in (DN)	1/2 (15)	1/2 (15)	1/2 (15)	1/2 (20)	1/2 (20)
Power requirements:						
230 V, 3 phase, 50/60 Hz	HP (kw)	1.6 (1.2)	3.4 (2.5)	4.3 (3.2)	7.4 (5.5)	9.4 (7.0)

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Ultromat® Polymer Preparation Systems

Options and Accessories

Description

Part No.

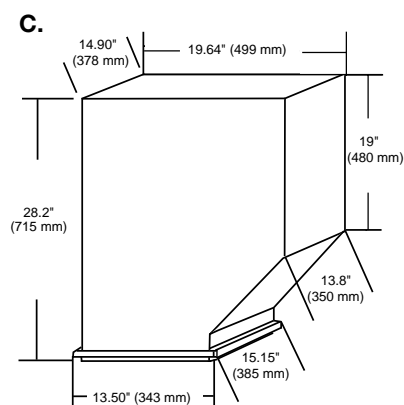
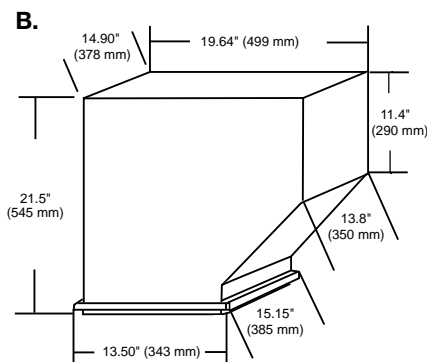
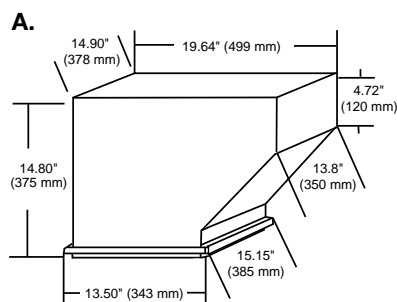
Optional Power Socket for Hopper Loader

Power socket for Hopper Loader. For connection of hopper loader unit. Includes electrical connector and safety overload cut-out. For all dry polymer systems.

Accessories for Ultromat® Systems

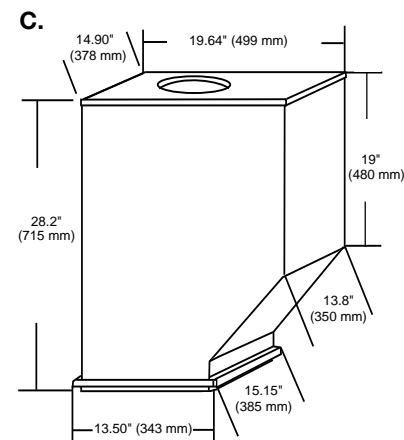
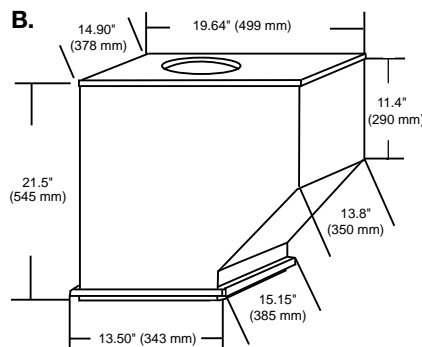
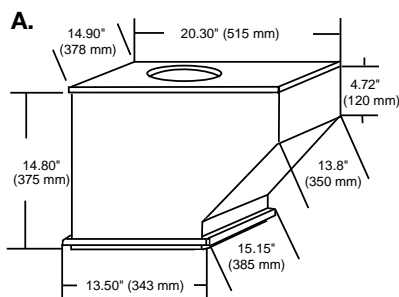
1. Hopper extension with cover (polypropylene)

- | | |
|--|---------|
| A. capacity 1.83 ft ³ (50 L) | 1005051 |
| B. capacity 2.65 ft ³ (75 L) | 1005052 |
| C. capacity 3.50 ft ³ (100 L) | 1005053 |



2. Hopper extension with adapter lid for hopper loader

- | | |
|--|---------|
| A. capacity 1.83 ft ³ (50 L) | 1005054 |
| B. capacity 2.65 ft ³ (75 L) | 1005055 |
| C. capacity 3.50 ft ³ (100 L) | 1005056 |

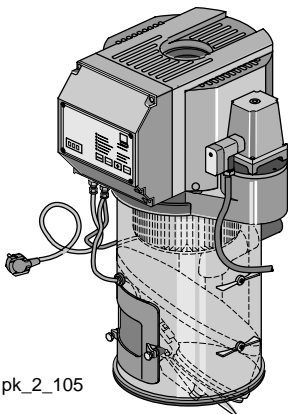


3. Adapter lid for hopper loader

Ultromat® Polymer Preparation Systems (cont.)

Description	Part No.
Accessories for Ultromat® Systems	

4. Ultromat hopper loader 205

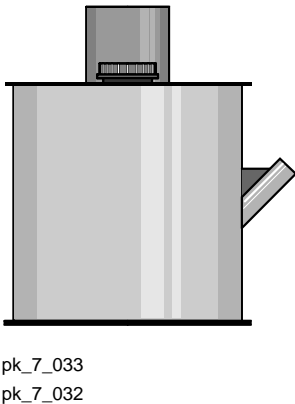


The Ultromat® hopper loader 205 acts to refill the dry feeder in the Ultromat systems (Ultromat® AT/96, ATF/96, ATP/96, ATD/96) with commercially available powdered polymers. With the aid of a suction hose and suction lance the powder is sucked out of the storage container (Big-Bag, powder storage tank) into the powder conveyor and via a flap into the powder feed screw of the polymer diluting station. The powder conveyor is self-operating and simply requires a 230 V DC terminal. External control contacts are not necessary. Depending upon the powder quality, approximately 165-198 lbs. (75-90 kg) of powder polymer per hour can be conveyed. The 13 ft. (4 m) feed tube and the suction nozzle are included as standard.

Feed rate: approximately 165 - 198.5 lbs/h (75 - 90 kg/h)

1000664

5. Powder storage tank



The Ultromat® powder storage tank is used for the interim storage of powdered polymers that have been delivered in Big-Bag containers. The Big-Bag is suspended over the storage tank from a gantry and its contents are emptied into the tank. The powder conveyor can suck the powder out with the aid of the suction lance.

Contents: 74 gallons (280 L)

1005573

Please consult factory for more options

5. Powder storage tank

Liquid Polymer Preparation System

(4-10 Gal/min)

S1-Polymer Makedown System



FEATURES

- Inexpensive unit for small direct feed applications.
- Compact, easy to set up and light-weight - ideal for field trials of polymer.
- Made entirely from corrosion resistant materials.
- Proprietary mixing eductor design is ideal for breaking tough to dissolve polymer emulsions and eliminating "fish-eyes".
- Can be combined with an age tank and level control to create a completely automated batch system.

DESIGN SPECIFICATIONS

The system is a compact polymer makedown system that is ideal for blending and breaking emulsion polymers with water. The unit can be operated continuously for direct feed to the customer's process or periodically when feeding into an aging tank. The unit includes a neat polymer pump, calibration tube, water dilution piping, flow meter, and mixing eductor.

SPECIFICATIONS

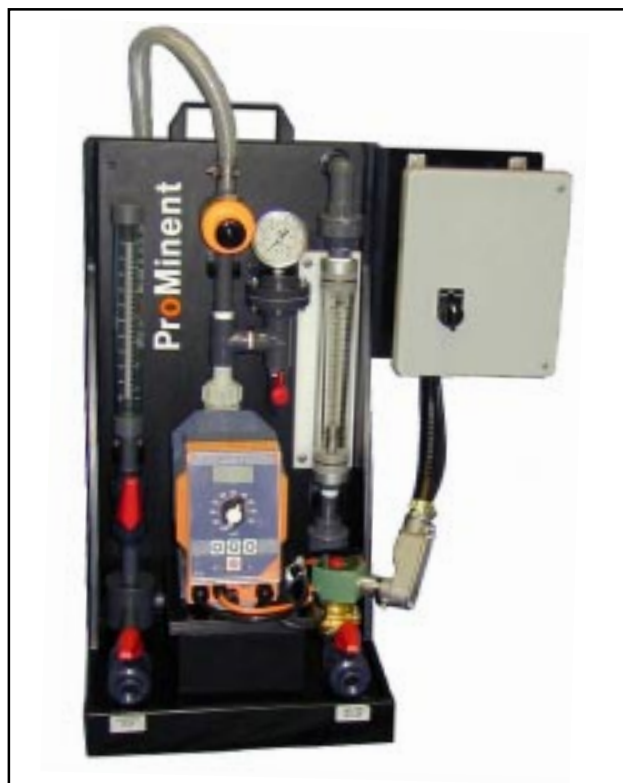
Ordering Information:	P/N 7740987 - S1 Polymer Makedown System
Metering Pump:	G5B 0813 PP5 000D21000 (3.5 gph max.)
Power Requirement:	115VAC 60 Hz, 10A
Water Requirement:	4 - 10 Gal/min @ 20 - 60 psi
Solution Output:	4 - 10 Gal/min @ 20 psi max.
Solution Concentration:	0.1 - 1.5%
Materials of Construction:	Stand: 304 SS Piping: Sch. 80 PVC Seals and O-Rings: Viton® Rotometer: Acrylic
Options:	Brass Solenoid Valve, Pump Model, and Stand Material
Inlet / Outlet Connections:	1/2" FNPT
Dimensions:	30" H x 14" W x 16" D
Shipping Weight:	50 lbs.

Liquid Polymer Preparation System

(15 to 38 L/min)

S1-Polymer Makedown System With Junction Box

ProMinent®



FEATURES

- Inexpensive unit for small direct feed applications.
- Compact, easy to set up and light-weight - ideal for field trials of polymer.
- Made entirely from corrosion resistant materials.
- Proprietary mixing eductor design is ideal for breaking tough to dissolve polymer emulsions and eliminating "fish-eyes".
- Can be combined with an age tank and level control to create a completely automated batch system.

DESIGN SPECIFICATIONS

The system is a compact polymer makedown system that is ideal for blending and breaking emulsion polymers with water. The unit can be operated continuously for direct feed to the customer's process or periodically when feeding into an aging tank. The unit includes a neat polymer pump, calibration tube, water dilution piping, flow meter, and mixing eductor.

SPECIFICATIONS

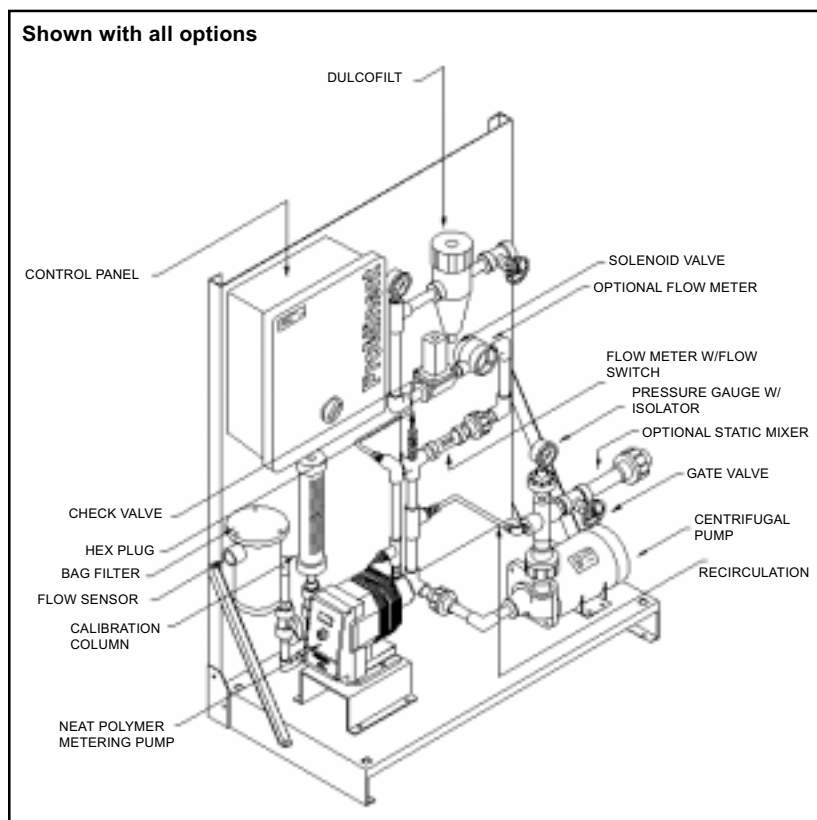
Ordering Information:	P/N 7902188 - S1 Polymer Makedown System (SS Stand) P/N 7902185 - S1 Polymer Makedown System (PP Stand)
Metering Pump:	G5B 1006 PP5 000D21000
Power Requirement:	115VAC 60 Hz, 10A
Water Requirement:	15 - 38 L/min @ 20 - 60 psi
Solution Output:	15 - 38 L/min @ 20 psi max.
Solution Concentration:	0.1 - 1.5%
Materials of Construction:	Stand: 304 SS or PE (Black) Piping: Sch. 80 PVC Seals and O-Rings: Viton® Solenoid Valve: Brass Rotometer: Acrylic Junction Box: NEMA 4X
Inlet / Outlet Connections:	1/2" FNPT
Dimensions:	34" H x 17" W x 15" D
Shipping Weight:	60 lbs.

Viton® is a registered trademark of Dupont Dow Elastomers
Specifications are subject to change without notice.

Technology that sets new standards... Worldwide!

Liquid Polymer Preparation System

**P
Series**



FEATURES

- Pre-engineered, self-contained portable unit, easy to set up, ready for installation and service.
- An innovative polymer preparation system allowing for optimum activation of polymer via a centrifugal pump/mixer with recirculation.
- ProMinent diaphragm metering pump designed for polymer, coupled with a calibration column and a flow meter to provide accurate control of polymer and water flow.
- NEMA 4X control panel with system Start/Stop switch. A flow switch on the water line will shut the system down if flow drops below the set flow.
- Stainless Steel Stand with Stainless Steel or PVC Piping.
- Union connections and flexlines for easy maintenance.

DESIGN SPECIFICATIONS

The ProMinent P-system is a liquid polymer make-down system using the mixing energy from a centrifugal pump to blend the neat polymer into the dilution water to form 0.1% to 1.0% polymer solutions. The P-system offers controlled make-up of emulsion polymers with the aid of a ProMinent neat polymer metering pump and a flow meter on the dilution water line. The P-system can inject from 1 gpm (225 L/h) to 5 gpm (1135 L/h) of polymer solution [up to 0.06 gpm (14 L/h) of neat polymer] directly into the process or into intermediate aging (storage) tanks. The P-systems are completely assembled and tested by ProMinent Fluid Controls.

Consult your ProMinent representative for other options such as level control, secondary dilution, and polymer aging systems.

Piping Materials: 316 SS or PVC

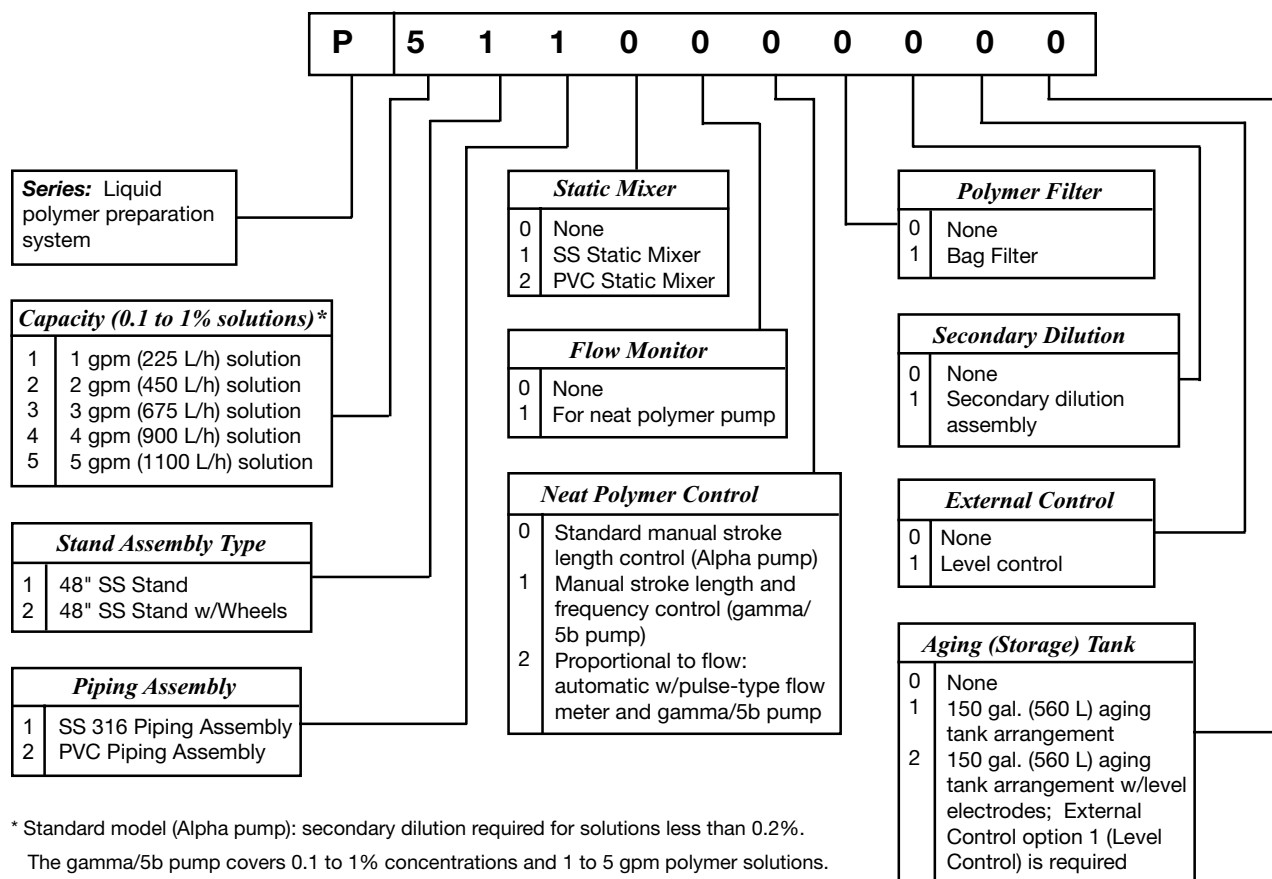
Connections: 1/2" FNPT Neat Polymer, 3/4" FNPT Dilution Water Line
1" FNPT Polymer Solution (Centrifugal pump outlet)

Dimensions: 48" H x 36" W x 20" D 122 cm H x 91 cm W x 51 cm D

Shipping Weights: 132 lbs. 60 kg

Technology that sets new standards... Worldwide!

P-Series PACKAGE CONFIGURATIONS



P - - - - -

Note: Please refer to the Identity Code descriptions on the next page.

MATERIALS SPECIFICATION

Ball Valves, PVC True union design, threaded or socketweld PVC with Viton® seals.

Ball Valves, SS Full-port 2-piece design, threaded 316 SS with PTFE seals.

Calibration Columns PVC, 100 mL, 2 mL grad., 1/2" FNPT

L-shaped Stand 304 SS, 12 gauge, #4 finish

Pipe & Fittings, PVC Socketweld and/or threaded, Schedule 80

Pipe & Fittings, SS Threaded. Schedule 40 316L SS Pipe; 150# 316 SS Fittings

Control Panel NEMA 4X, Stainless Steel

Notes:

- 1) Power supply 115V/60Hz/1phase. Max. current draw (with all options) = 15 A. Motor centrifugal pump: 1/2 HP.
- 2) Brass components: Dulcofilt filter and solenoid valve.
- 3) alpha metering pump (base model): polypropylene liquid end spring loaded; max. capacity is 3.7 gph (14 L/h) @ 80 psig; max. viscosity is 5000 cP.
- 4) gamma/b metering pump (optional): special high viscosity polypropylene liquid end (max. viscosity is 5000 cP)
- 4a) gamma/5b 0813: max. capacity is 3.4 gph (13.1 L/h) @ 80 psig.
- 4b) gamma/4b 1002: max. capacity is 0.45 gph (1.72 L/h) @145 psig.

Specifications and prices are subject to change without notice.

Contact your ProMinent representative for the latest information.

Viton® is a registered trademark of DuPont Dow Elastomers

P-Series IDENTITY CODE DESCRIPTIONS

SERIES:

P-Series: Liquid Polymer preparation system

CAPACITY:

Flow rates of 0.1 to 1% polymer solution. With alpha pump (standard), concentrations less than 0.2% requires a secondary dilution. The gamma/5b pump covers 0.1 to 1% concentration of 1 to 5 gpm solutions. The gamma/4b pump has a capacity of 0.45 gph (1.72 L/h) @ 145 psig.

- 1 = 1 gpm (225 L/h) of polymer solution
- 2 = 2 gpm (450 L/h) of polymer solution
- 3 = 3 gpm (675 L/h) of polymer solution
- 4 = 4 gpm (900 L/h) of polymer solution
- 5 = 5 gpm (1100 L/h) of polymer solution

STAND ASSEMBLY TYPE:

- 1 = 48" Stainless Steel Stand Assembly
- 2 = 48" Stainless Steel Stand with wheels Assembly

PIPING ASSEMBLY:

- 1 = Stainless Steel 316 Piping/ Ball Valve Assembly
- 2 = PVC Piping/ Ball Valve Assembly

STATIC MIXER:

Static mixer at centrifugal pump outlet helps enhance mixing

- 0 = None
- 1 = Six elements SS 1" MNPT Static Mixer
- 2 = Six elements PVC 1" MNPT Static Mixer

FLOW MONITOR (Neat Polymer Pump):

- 0 = Standard, flow monitor on water line, shuts downs system if low flow
- 1 = Flow monitor for neat polymer pump shuts down system if low flow (flow monitor on water line included)

NEAT POLYMER CONTROL:

- 0 = Standard: manual stroke length control; Alpha pump: stroke length adjustment in 10% increments
- 1 = Manual stroke length and frequency control; gamma/b pump: stroke length adjustment in 1% increments, frequency adjustment: 1 to 100 strokes per minute
- 2 = Proportional to flow (automatic) Pulse-type flow meter paces gamma/b pump: stroke length adjustments in 1% increments, frequency adjustment by flow meter (standard K factor is 1 liter/pulse)

POLYMER FILTER:

A polymer filter helps prevent the neat polymer from forming gels ("clogs")

- 0 = None
- 1 = SS Bag Filter

SECONDARY DILUTION:

- 0 = None
- 1 = Secondary Dilution Assembly includes flow meter and PVC static mixer mounted on a PVC back board

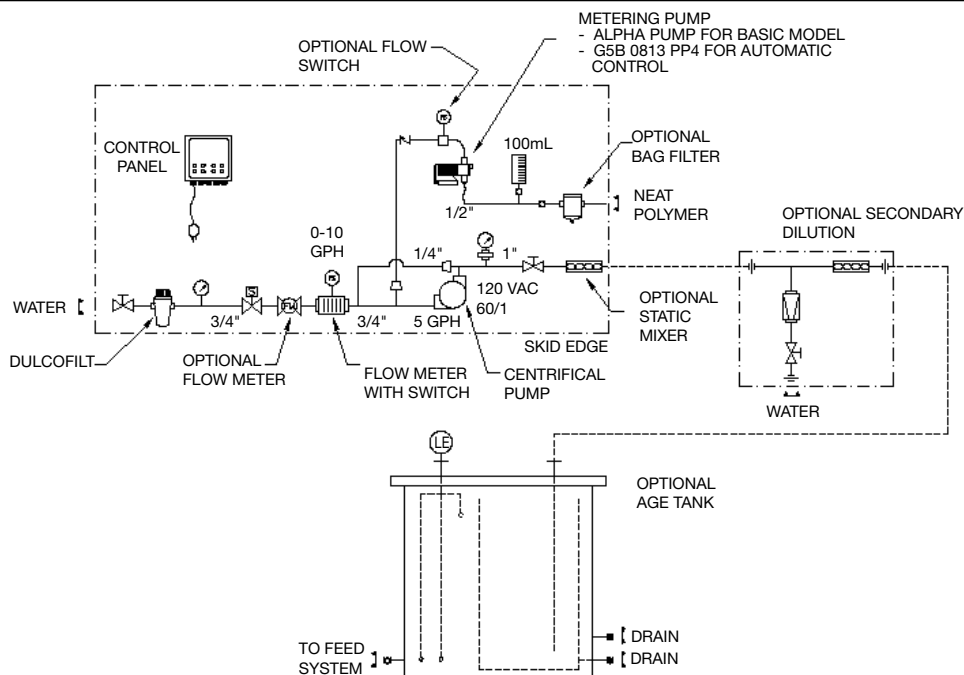
EXTERNAL CONTROL:

- 0 = None
- 1 = Level Control inputs to control panel from Aging Tank: system will shut down on high level and restart on low level

AGING (STORAGE) TANK:

- 0 = None
- 1 = 150 gal tank (560 L) with 55 gal (200 L) inner aging tank arrangement
- 2 = 150 gal tank (560 L) with 55 gal (200 L) inner aging tank arrangement with level electrodes

NOTE: Level Control (option 1 on External Control) is required with Aging Tank option 2.



P-Series SIZING

F = process flow rate (L/h)

D = polymer dosage to process (ppm = mg/L)

C = concentration of polymer solution (%) (This is the concentration at the discharge of the P-Series system, not the percent active of the neat polymer.)

S = feed rate of C% polymer solution required to treat F L/h at a dosage of D ppm

P = feed rate of required neat polymer (kg/h)

EXAMPLE: a wastewater treatment plant needs to add 20 ppm of a 0.25% polymer solution to treat 125,000 L/h:

F = 125,000 L/h D = 20 ppm C = 0.25%

step 1: determine P, the feed rate of neat polymer required:

$$P = F * D * 10^{-6} \text{ kg/mg} = P \text{ (kg/h)}$$

$$P = 125,000 \text{ L/h} * 20 \text{ mg/L} * 10^{-6} \text{ kg/mg} = 2.5 \text{ kg/h}$$

step 2: determine S, the required feed rate of polymer solution, by:

A) using the chart below and a ruler, draw a line through P and C to obtain the corresponding feed rate of required polymer solution S on the right:

the P unit required is a P-5

OR B) calculate S:

$$S = P * 100 / C = S \text{ (kg/h)}$$

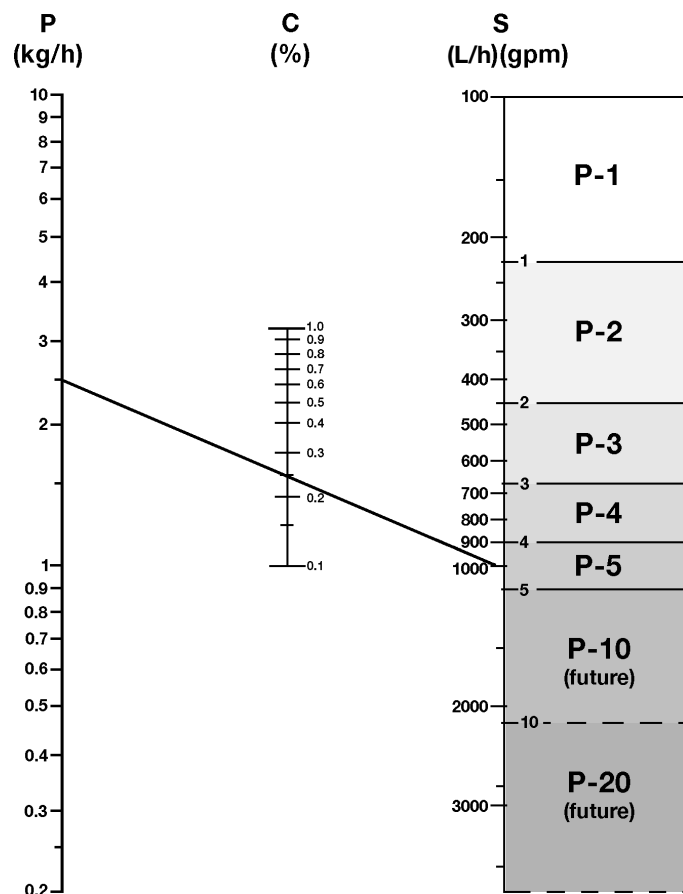
$$S = 2.5 \text{ kg/h} * 100 / 0.25 = 1000 \text{ kg/h}$$

$$S = 1000 \text{ L/h for a specific gravity of 1}$$

$$S = 4.4 \text{ gpm (P-5)}$$

NOTE: chart for solutions of S.G. = 1 (1 kg/h = 1 L/h)

to obtain the flow rate divide the feed rate by the specific gravity of the solution



P = Polymer
C = Concentration
S = Solution

Conversion Table

1 lb = 0.454 kg

1 U.S. gal = 3.785 liters

1 gpm = 227 L/h

$10^{-6} = 0.000001$

((THIS IS A MASTER, EDIT FOR SPECIFIC APPLICATION))
PROMINENT FLUID CONTROLS, INC. - ULTROMAT
SECTION - POLYMER FEED SYSTEM

PART 1 - GENERAL

1.01 DESCRIPTION

- A. The polymer feed system shall be capable of making down dry polymer, and shall include dry feeder, wetting system, three-compartment tank mix, aging and storage tank with one hour total retention time, and automatic control system.

1.02 QUALITY ASSURANCE

- A. The polymer system manufacturer shall provide a one year warranty beginning at the date of startup.
- B. The polymer system shall be fully tested to meet required capacity, by the manufacturer prior to shipment.
- C. All options and accessories shall be provided by the polymer system manufacturer to ensure system compatibility.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Components:
 - 1. The Mixing/Aging/Storage Tank shall be of welded polypropylene for corrosion resistance. The interior shall be divided into three compartments of equal volume, separated such that the flow from each upstream compartment flows under a baffle, then up over a weir, to ensure that fresh polymer cannot short circuit into aged polymer. Each compartment shall feature a stainless steel mixer. The compartments shall be externally manifolded with manual shutoff valves to allow complete utilization of the polymer.
 - 2. The Dry Polymer Feeder shall have a storage volume of 4.2 cubic feet, with dry powder level sensor to alarm upon low powder level. The auger shall be driven by a variable speed motor for calibration, and shall feature a heated powder dryer at the discharge and a solenoid-type positive closure device to prevent afterrun during shutdown.
 - 3. The Wetting System shall consist of an incoming water line with pressure regulating valve, pressure gauge, flow meter with audible alarm on loss of flow, solenoid valve and manual shutoff valve. Incoming water line shall manifold into independently valved lines, one to a venturi and one to a funnel with water vortex discharging to a vacuum created by the venturi, which discharges to the primary mix compartment, such that newly added powder polymer is always contacting fresh water, eliminating clots of unmixed polymer. Motor-driven in-line mixing devices or compressed air type wetting devices shall not be allowed due to shear and operational cost, respectively. A high level overflow weir on the funnel shall discharge to the primary mix compartment, and a high level sensor shall provide an audible alarm upon overflow.
 - 4. The Control Panel shall be NEMA 4X, with audible fault alarm and reset button and programmable logic controller. The controller shall allow proportional dosing of the powder to the water flow rate, and shall allow programming of the polymer concentration during operation.

Programmable parameters shall include dry feeder speed, dry feeder temperature control, and mixer on/off times. Power supply shall be 230 VAC, 60 Hz, three phase.

B. System Function and Operation:

1. Calibration to a specific polymer concentration shall be accomplished by programming the desired concentration, which varies the dry feeder discharge rate in proportion to water flow rate.
2. Operation shall be continuous, controlled by the level in the storage compartment as drawn down by the progressing cavity pump. Upon high level, the system shall shut down by first stopping polymer feed, then stopping water flow. Upon low level, the system shall automatically re-start, by starting water flow before polymer feed.

C. Capacity Specifications:

1. Polymer solution at ____% concentration: ____ gallons per hour.

D. ACCEPTABLE MANUFACTURER:

1. PROMINENT FLUID CONTROLS, INC.,
- E. Ultromat AT____
2. or approved equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. The polymer system installation shall be in accordance with manufacturers recommendations.
- B. The Manufacturer's representative shall provide two days supervision of startup, calibration and operator training.

END OF SECTION