

Model PST Portable Peristaltic Samplers



Manning Environmental Model PST



PST Control Panel



The PST Is Suitable for Use in Manholes

◆ **Innovative Design.**

Model PST samplers use a unique 3/8-inch internal diameter (ID) peristaltic pump that significantly increases tubing life without sacrificing pump performance. It is the only peristaltic sampler on the market that is less than 18 inches in diameter and has space for 24 one-liter bottles and ice in an insulated bottle case. The use of Cool Mann™ (U.S. Patent Pending) can further extend the life of the ice 8+ hours (see Accessories). The PST provides composite or discrete sampling of non-toxic liquids.

◆ **Reliable Peristaltic Pump.**

The heart of the PST sampler is a powerful, field-proven 3/8-inch ID peristaltic pump that easily delivers samples in excess of the EPA-recommended minimum of 2-foot/second transport velocity over a wide range of head heights. A clear plastic cover enables visual inspection of the rollers and tubing without dismantling the pump. An integral safety kill switch prevents powered rotation when the cover is removed, making it safe to check and replace the pump tubing. The revolutionary pump body and roller design increases pump tubing life-saving time, maintenance, and money.

◆ **Accurate, Repeatable Sample Volumes.**

PST samplers provide consistent and accurate sample volumes even with changing head heights. The sophisticated software, coupled with either continuity or advanced ultrasonic fluid sensor technology, ensures even greater accuracy and repeatability.

◆ **Versatile Controller.**

The sampler bottle case and microprocessor-based controller are housed in NEMA 4X/NEMA 6 enclosures for environmental protection. The controller offers advanced functionality and features such as data logging, review of settings and operating status, with a variety of flow and time modes. With its step-by-step menu format, dedicated-button keypad, and large backlit LCD, the controller is simple to set up, even in the dark! Easy to understand prompts and shortcut keys save manpower and time by enabling the operator to quickly change or review programming and settings, avoiding frustrating navigation through long, complicated menu structures.

◆ **Single or Multiple Bottle Sampling.**

The PST sampler has various bottle options for single or 24-bottle sampling of non-toxic liquids. Changing from multiple to single bottle sampling operation can be accomplished in the field without using special tools.

◆ **Comprehensive, Flexible Programming.**

The exceptional sampling software is designed to be highly flexible and easy to use. The menu-driven system provides many programming features. (See partial listing in specifications on page 2.)

◆ **Durable Construction.**

The PST sampler is constructed of materials that will stand the test of time. The thick walls of the chassis are made of impact- and corrosion-resistant Acrylonitrile Butadiene Styrene (ABS). Stainless steel hardware is further protection from harsh environments. The double-walled bottle case keeps samples cooler longer. Lastly, the bright yellow color of Manning samplers increases visibility, and reflects the sun to reduce heat buildup and ice melting.

Specifications

Size	27.75 in. (70.5 cm) high × 17.75 in. (45.08 cm) diameter
Weight (dry).....	34 lbs (15.42 kg) with 24-bottle positioning rack and 24 empty 1-liter sample bottles (without battery); 12 volt, 7 amp hour (standard) battery 5.5 lbs (2.4 kg); 12 volt, 17 amp hour battery 15.0 lbs (6.8 kg)
Environmental Protection	NEMA 4X/NEMA 6 ABS housing around electromechanical components with stainless steel hardware
Sample Cooling.....	Bottle case holds 15 lbs of ice with 24 one-liter bottles and has an average thermal resistance factor of R-12
Temperature Limits	32–122° F (0–50° C)
Sample Pump.....	High-speed peristaltic 12 VDC 3/8-inch ID pump with impact and corrosion-resistant plastic pump body and dual-roller mechanism
Pump Safety.....	Clear pump cover removal stops powered rotation of pump
Pump Tubing/Tubing Life	Silicone tubing/typical 1.25 million revolutions life
Maximum Lift.....	28 ft (8.2 m)
Transport Velocity	4.396 ft/sec @ 5 ft. of lift (1.34m/sec @ 1.5 m of lift) exceeding the EPA-recommended minimum transport velocity of 2 ft/sec
Sample Volume.....	Programmed directly in 1-ml increments
Repeatability	±5% of the set sample volume typical
Fluid sensor.....	Continuity type or optional ultrasonic
Membrane Keypad.....	Hermetically sealed 24-key, multiple function keypad with 2-line by 20-character alphanumeric backlit LCD
Sample Programming	Programming features include but are not limited to:
	<ul style="list-style-type: none">• Data logging (512 event capacity)• Flow proportional pacing (contact closure)• Flow pacing with time override capability• Flow pacing with delay sampling feature• Flow pacing with maintained event sampling• Totalized flow pacing (analog input)• Uniform and non-uniform time intervals• Multiple bottles per sample• Multiple samples per bottle• Multiple bottle compositing• Bottle grouping• Program delay (time or flow)• Sampling based on external device input• Hydrologic level event mode (storm water sampling)• Real-time clock• Password protection• Settable sample volume• Pump tubing life warning indication• Manual test cycle• Activity review log (current and past)• Intake fault alert• Intake line rinse• Intake line purge• Automatic shut-off• Power fail/auto restart
Internal Clock	Indicates real time within 1 minute per month accuracy
Internal Battery Backup.....	5-year internal lithium battery to maintain program logic, RAM memory, real-time clock, and date
Power Requirement	Standard: External 12-volt, 7-amp-hour battery Optional: External 12-volt, 17-amp-hour battery or 110–220 VAC power supply (for use without battery)
Input/Output (optional)	Closed contact or 12 VDC pulsed input with or without 4–20-mA input and/or RS-232 output in various combinations
Warranty:.....	One year from date of shipment.

Ordering Information

Model PST Sampler Spare Parts/Accessories

- **Replacement Batteries:**
External 12 volt, 7-amp-hour battery P/N 690539
External 12 volt, 17-amp-hour battery P/N 690536
- **Battery Chargers:**
Standard-output Rapid/Float Two-stage Charger for 110 VAC operation (12 VDC @ 750 mA) P/N 885400
High-output Rapid/Float Two-stage Charger for 110/220 VAC operation (12 VDC @ 1.25 A) P/N 889825
- **External 110-220 VAC Power Supply P/N 889927**
Converts line power to 12 VDC to power sampler instead of a battery.
- **Multiple-to-Single Bottle Conversion Kit P/N 885012**
For non-toxic use only. Includes bottle-full sensor and harness but not a bottle, which must be ordered separately.
- **Quick Disconnect Fittings**
3/8-inch female quick disconnect fitting P/N 552104
3/8-inch male quick disconnect fitting P/N 552105
- **Replacement Pump Tubing**
3/8-inch silicone tubing (pre-cut 22-inch length) P/N 889923
3/8-inch silicone tubing (bulk by the inch) P/N 566925
- **Replacement Intake Hose**
3/8-inch bulk clear intake hose P/N 566917*
3/8-inch bulk Teflon®-lined intake hose P/N 566920*
**Please specify required length in feet.*
- **Cables:**
3 ft. (1 m) long, 4-pin plug contact/pulse/analog cable P/N 818016
10 ft. (3 m) long, 4-pin plug contact/pulse/analog cable P/N 818018
Serial Output 6-inch RS-232 Patch Cable P/N 810059
Battery Cable: 18-inch (0.5 m) long cable terminated with 2-pin female plug for sampler connection and two alligator clips to connect the battery. P/N 818015
- **Extra Bottles:**
2.5-gallon polyethylene bottle P/N 687547
4-gallon polyethylene bottle P/N 687551
5-gallon polyethylene bottle P/N 687535
2.5-gallon glass bottle w/Teflon® cap liner P/N 889715
Set of 24 1000-ml polyethylene bottle P/N 889117
Set of 24 500-ml polyethylene bottle P/N 889041
5-gallon Bucket Mann™ with splashguard & transport lid P/N 889721
- **Suspension Harness P/N 889042**
- **Cool Mann™**
Cool Mann™ radiant barrier wrap for PST P/N 889726
Cool Mann Jr.™ radiant barrier wrap for Bucket Mann P/N 889725
- **Manual:**
P/N MAN-PST

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In the interest of improving and updating its equipment, Manning reserves the right to alter specifications to equipment at any time.

Engineering Specifications

1. A Manning Model PST-series sampler is suitable for automatic collection and preservation of composite or discrete non-toxic liquid samples.
2. The sampler is cylindrical in shape and suitable for suspension in 18-inch manholes.
3. The enclosure is impact and corrosion-resistant ABS with NEMA 4X/NEMA 6 ratings, and has stainless steel carrying handles, fittings and latches.
4. All wetted parts have a minimum internal diameter of 3/8 inch and are stainless steel or PVC (optional strainer), PVC or Teflon® (sampling hose), and silicone (pump tubing).
5. The sampler incorporates a high-speed 3/8-inch ID peristaltic pump with two rollers at least 0.7 inch (17.78 mm) in diameter to increase tubing life. Pumps using smaller rollers are unacceptable. The roller mechanism uses a bearing to increase pump life. Samplers that do not use such a mechanism are not acceptable. The pump body shall be constructed of corrosion and impact resistant ABS. The pump mechanism has a clear cover plate to enable visual inspection of rollers, pump spindle, and tubing. Samplers requiring removal of part or its entire pump housing for visual inspection are unacceptable.
6. The sample liquid is under forced flow at all times and does not pass through a metering chamber, valves, or distribution plate. It is equipped with a liquid sensing system that calculates the flow rate of the liquid in the intake line every collection cycle.
7. When sampler is ordered for multi-bottle, field conversion to provide composite or discrete sampling is possible in the field without using special tools.
8. The sampler collects composite and/or discrete samples. For composite sampling, an overflow protection mechanism automatically terminates any further sampling. Discrete sampling can be multiple bottles of the same sample or multiple samples in multiple bottles. Systems that rely on sensing bottle weight to determine sample volume is unacceptable due to the variance in sample densities, and the need to calibrate the weight sensing mechanism.
9. Bottle-full condition is detected using a stainless steel sensor located in the bottleneck. It is easily removable for cleaning or replacement without using special tools.
10. The sampler is capable of a transport velocity of 4.396 ft/sec through 3/8-inch ID tubing at a draw height of 5 feet, thereby easily exceeding the EPA-recommended transport velocity of 2 ft/sec.
11. The sampler has an optional weighted strainer of PVC or stainless steel.
12. A hermetically sealed 24-button keypad and a 2-line by 20-character alphanumeric backlit LCD is linked to a programmable CPU.
13. The sampler is powered by:
 - a) The standard external 12-volt, 7-Amp-hour lead acid battery.
 - b) An optional external 12-volt, 17-Amp-hour lead acid battery.
 - c) An optional external 110/220 VAC power supply.
14. An optional external battery charger capable of trickle charging the sampler battery during operation is included. The charger is a:
 - a) Standard-output rapid/float 2-stage charger for 110 VAC operation, providing 12 VDC @750 mA, or
 - b) High-output rapid/float 2-stage charger for 110/220 VAC operation, providing 12 VDC @ 1.25 A.
15. The sampler uses no unique symbols or codes for programming or to indicate operating conditions. The software is menu-driven and prompts input of requested information using the keypad. The display indicates each programming step. After entering data, the system automatically advances to the next programming step.
16. A password feature to restrict access to authorized persons only is included.
17. A sampling program may be delayed by entering the time in hours and minutes for the sampler to count down, or by the number of contact closures to occur. The delay is independent of the sampling interval.
18. The sampler purges the sample hose immediately prior to and following each sample. Purge duration is selectable.
19. User-selected capability to rinse the sample hose with source liquid prior to each sample is included.
20. When a sample is not obtained on the first attempt, the sampler immediately retries to collect the sample. If a sample still cannot be collected, that sample will be omitted and the sampling sequence continues.
21. When initiated by a keystroke, sampler is capable of manual sampling independent of a programmed sequence. The sampler logs manual collections and is selectable to allow taking test samples:
 - a) Only when sampler is not running a program,
 - b) During a program but the test sample is not counted as a sample, or
 - c) During a program and the test sample is counted as a sample.
22. In the time mode, the interval between samples is adjusted (1– 5999 min. in 1-minute increments). In the flow mode, the sampler accepts and totalizes contact closures (1–9999), a 12 VDC pulsed input, or a 4–20-mA DC analog signal input for sampler at a user set point.
23. A hydrologic event algorithm enables sample programming based on a combination of parameters including water level, differential (rising and falling) water levels, as well as time defaults established by the U.S. Geological Survey for hydrologic events.
24. Sampler operating status is reviewed with minimal effort, and includes:
 - Program status
 - Current time
 - Time and date program started
 - Active bottle number
 - Active group period
 - Number of samples collected
 - Volume collected
 - Number of contact closures
 - Number of line blockages
 - Minutes or flow signals remaining to the next sample
 - Number of samples remaining
 - Volume remaining
 - Time to override
25. All program settings are reviewed in addition to seeing the review of the completed program.
26. The sampler is a Manning Model PST series.

Data Sheet PST 09/14/09

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