

Model PST Portable Peristaltic Samplers

◆ 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 PST provides composite or discrete sampling of non-toxic liquids.



PST Control Panel

◆ 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

◆ 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.

time, maintenance, and money.

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◆ 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.



The PST Is Suitable for Use in Manholes

◆ 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 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.



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Manning PST Peristaltic Sampler

Specifications

Size (HxWxD):	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, 8 amp hour (standard) battery 5.5 lbs (2.4 kg); 12 volt, 18 amp hour battery 15.0 lbs (6.8 kg)
Environmental Protection	NEMA 4X/NEMA 6 structural resin housing around electromechanical components
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
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 (8.5 m)
Transport Velocity	4.396 ft/sec @ 5 ft of lift (1.34 m/sec @ 1.5 m of lift) which easily exceeds the EPA-recommended minimum transport velocity of 2 ft/sec (0.61 m/sec)
Sample Volume	Programmed directly in 1-ml increments
Repeatability	±0.5% of set volume (typical)
Fluid sensor	Continuity type or optional non-contacting ultrasonic
Membrane Keypad	Hermetically sealed 24-key, multiple function keypad with 2-line by 20-character alphanumeric backlit LCD

Sampler Programming

Programming features include but are not limited to:

- 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

Power & Clock

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
Power Requirement	110 VAC (60 Hz) or, 220 VAC (50 Hz), both with battery backups available.
Input/Output (optional)	Contact closure with or without 4–20-mA input and/or RS-232 output in various combinations

Warranty

One year from date of shipment.

Ordering Information - Accessories

Model PST Sampler Spare Parts/Accessories

<ul style="list-style-type: none"> • Replacement Batteries: External 12 volt, 8-amp-hour battery P/N MS690539 External 12 volt, 18-amp-hour battery P/N MS690536 • Battery Chargers: Standard-output Rapid/Float Two-stage Charger for 110 VAC operation (12 VDC @ 750 mA) P/N MS885400 High-output Rapid/Float Two-stage Charger for 110/220 VAC operation (12 VDC @ 1.8A) P/N MS889825 • External: 110-220 VAC Power Supply P/N MS889927 Converts line power to 12 VDC to power sampler instead of a battery. • Multiple-to-Single Bottle Conversion Kit P/N MS885012 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 MS552111 3/8-inch male quick disconnect fitting P/N MS552110 • Replacement Pump Tubing: 3/8-inch silicone tubing (pre-cut 22-inch length) P/N MS889923 3/8-inch silicone tubing (bulk by the foot) P/N MS566925B 	<ul style="list-style-type: none"> • Replacement Intake Hose 3/8-inch bulk clear intake hose P/N MS566917* 3/8-inch bulk Teflon®-lined intake hose P/N MS566920* <i>*Please specify required length in feet.</i> • Cables: 3 ft. (1 m) long, 4-pin plug contact/pulse/analog cable P/N MS818016 10 ft. (3 m) long, 4-pin plug contact/pulse/analog cable P/N MS818018 Serial Output 6-inch RS-232 Patch Cable P/N MS810059 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 MS818015 • Extra Bottles: 2.5-gallon poly-ethylene bottle P/N MS687547 4-gallon poly-ethylene bottle P/N MS687551 5-gallon poly-ethylene bottle P/N MS687535 2.5-gallon glass bottle w/Teflon® cap liner P/N MS889715 Set of 24 1000-ml poly-ethylene bottle P/N MS889117 Set of 24 500-ml poly-ethylene bottle P/N MS889041 5-gallon Container with splashguard & transport lid P/N MS889721 • Suspension Harness: P/N MS889042 • 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.



Ordering Information

MODEL NUMBER													
PST8 3/8-inch ID Peristaltic Pump Portable Sampler System													
POWER SOURCE (Battery cable included with all samplers)													
A None B 12-volt, 8-amp-hour sealed lead acid battery C 12-volt, 18-amp-hour sealed lead acid battery D 12-volt Power Supply 110-220 VAC input (for use without battery)													
BATTERY CHARGER TYPE (for use with Power Source Options B and C only)													
1 None 2 12V 750mA three-stage charger 110 VAC input for sealed lead acid battery 3 12V 1.8A (high-output) two-stage charger 110/220 VAC input													
INPUT/OUTPUT OPTION (3' input cable included with all units, and patch cable for RS-232 output when applicable)													
<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> A Contact closure input B Contact closure and 4–20-mA input C Contact closure and RS-232 output D Contact closure and analog (4–20-mA) input with RS-232 output </td> <td style="width: 50%; border: none;"> E 12 VDC pulsed input F 12 VDC pulsed input and 4–20-mA input G 12 VDC pulsed input and RS-232 output H 12 VDC pulsed input and 4–20-mA input with serial out (RS-232) output </td> </tr> </table>								A Contact closure input B Contact closure and 4–20-mA input C Contact closure and RS-232 output D Contact closure and analog (4–20-mA) input with RS-232 output	E 12 VDC pulsed input F 12 VDC pulsed input and 4–20-mA input G 12 VDC pulsed input and RS-232 output H 12 VDC pulsed input and 4–20-mA input with serial out (RS-232) output				
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FLUID SENSOR													
1 Continuity sensor 2 Ultrasonic sensor													
BOTTLE CONFIGURATION													
A Single bottle (for composite sampling) C Multi-bottle (for discrete sampling)													
BOTTLE TYPE													
<table style="width: 100%; border: none;"> <tr> <td style="width: 60%; border: none;"> 1 None 2 2.5-gallon poly-ethylene bottle 3 5-gallon poly-ethylene bottle 4 4-gallon poly-ethylene bottle 5 2.5-gallon glass bottle w/Teflon cap liner 9 5-gallon poly-ethylene pail with snap-on lids </td> <td style="width: 40%; border: none;"> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> 6 (24) 1000 ml poly-ethylene bottle 7 (24) 500 ml poly-ethylene bottle </td> <td style="width: 50%; border: none; vertical-align: middle;"> } Multi-bottle sets for discrete sampler </td> </tr> <tr> <td style="border: none;"> } Individual bottles for composite sampler </td> <td style="border: none;"></td> </tr> </table> </td> </tr> </table>								1 None 2 2.5-gallon poly-ethylene bottle 3 5-gallon poly-ethylene bottle 4 4-gallon poly-ethylene bottle 5 2.5-gallon glass bottle w/Teflon cap liner 9 5-gallon poly-ethylene pail with snap-on lids	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> 6 (24) 1000 ml poly-ethylene bottle 7 (24) 500 ml poly-ethylene bottle </td> <td style="width: 50%; border: none; vertical-align: middle;"> } Multi-bottle sets for discrete sampler </td> </tr> <tr> <td style="border: none;"> } Individual bottles for composite sampler </td> <td style="border: none;"></td> </tr> </table>	6 (24) 1000 ml poly-ethylene bottle 7 (24) 500 ml poly-ethylene bottle	} Multi-bottle sets for discrete sampler	} Individual bottles for composite sampler	
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SAMPLING HOSE TYPE (all 3/8-inch ID)													
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SAMPLING STRAINER TYPE													
1 None 2 PVC strainer 3 Stainless steel strainer													
Manual included with all samplers.													
PST8													
							Configuration Number						

Choose one from each category.

Engineering Specification

1. The sampler is suitable for automatic collection and preservation of composite or discrete non-toxic liquid samples.
2. The controller enclosure is made of structural resin with NEMA 4X/NEMA 6 ratings.
3. All wetted parts have a minimum internal diameter of 3/8 inch (9.53 mm), and are stainless steel or PVC (optional strainer), PVC or Teflon (sampling hose), and silicone (pump tubing).
4. The sampler incorporates a high-speed 3/8-in (9.53 mm) ID peristaltic pump with two rollers of at least 0.7-in (17.78 mm) diameter to increase tubing life. Pumps using smaller rollers are unacceptable. The roller mechanism uses a bearing to increase pump life. The pump body is constructed of corrosion-resistant, high-impact Acrylonitrile Butadiene Styrene (ABS). The pump mechanism has a clear cover plate which enables visual inspection of rollers, pump spindle, and tubing. Samplers requiring removal of part or all of the pump housing for visual inspection is unacceptable.
5. The sample liquid must be under forced flow at all times and shall not pass through a metering chamber, distribution plate, or valves. The sampler is equipped with a liquid sensing system that calculates the flow rate of the liquid in the intake line each collection cycle.
6. Using the optional kit, multi-bottle unit is convertible in the field to single bottle without using special tools.
7. The sampler collects composite and/or discrete samples. For composite sampling, an overflow protection mechanism shall automatically terminate any further sampling (see #8). Discrete sampling can be multiple bottles of the same sample or multiple samples in multiple bottles.
8. Bottle full condition is detected by using a stainless steel sensor located in the bottleneck. It is easily removable for cleaning or replacement without using special tools.
9. Systems relying upon sensing bottle weight to determine sample volume shall be unacceptable due to the variance in sample densities, and the need to calibrate the weight sensing mechanism.
10. The sampler is capable of transport velocity of 4.396 ft/sec through 3/8-in (9.53 mm) ID tubing at a draw height of 5 ft (1.5 m) using the 3/8-in (9.53 mm) ID pump, which is well in excess of the EPA-recommended minimum of 2 ft/sec (0.61 m/sec).
11. A hermetically sealed 24-button keypad and a 2-line by 20-character alphanumeric backlit LCD is linked to a programmable CPU.
12. The Standard Refrigerator is available with two choices of finish/color: 1) a carbon steel exterior (with iron phosphate pretreatment) covered by white baked acrylic enamel or 2) a stainless steel exterior. The refrigerator condenser is made of carbon steel with baked enamel finish. Copper refrigerant lines are coated with asphalt cork tape for protection from hydrogen sulfide gas. A thermostat included within the refrigerator ensures that a temperature of 32–39° F (0–4° C) is maintained. The evaporator plates have a baked-on, powder coat paint finish to protect the metal. The fan motor is unit bearing. The 4.1 cu. ft. Refrigerator is for single bottle, protected from the elements, indoor, or sheltered applications, only. The exterior is black enamel-coated steel. The cabinet and door insulation are polyurethane with a food-grade quality interior plastic liner for cabinet and door. The thermostat will maintain the EPA recommended temperature of 32–39° F (0–4° C) as long as the ambient temperature is within 40–110° F (4.44–43.34° C). The capacity is 4.1 cu. ft (0.14 cu. m). Please see the 4.1 cu. ft. Refrigerator Data Sheet for more specifications.
13. The Standard Refrigerator has a 440-BTU compressor with a high-efficiency fan and condenser arrangement permitting reliable operation in high ambient temperatures. Foam insulation is CFC-free poly-ethylene with an interior liner of food grade plastic.
14. Unique symbols or codes for programming or to indicate operating conditions are not used. The software is menu driven, prompting 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.
15. A password feature restricts access to authorized persons only.
16. A sampling program can be delayed by entering the number of hours and minutes for the sampler to count down, or the number of contact closures to occur. The delay is independent of the sampling interval.
17. The sampler purges the sample hose immediately prior to and following each sample. Purge duration is selectable.
18. The sampler has the capability to rinse the sample hose with source liquid prior to each sample selected by user.
19. The sampler has an optional weighted strainer of PVC or stainless steel.
20. If a sample is not obtained on the first attempt, the sampler immediately retries to collect the sample. If a sample still cannot be collected, the sampler will omit that sample and continue the sampling sequence.
21. When initiated by a keystroke, the 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 the sampler is not running a program,
 - b) During a program but the test samples are not counted as a sample, or
 - c) During a program and the test samples count as a sample.
22. In the Time Mode, the interval between samples is adjustable (1–5999 min. in 1-minute increments). In the Flow Mode, it accepts and totalizes contact closures (1–9999). A 12 VDC pulsed input or a 4–20-mA DC analog signal input for sampling at a user set point are also available.
23. A hydrologic event algorithm is used to enable sample programming for hydrologic events based on a combination of parameters including water level, differential (rising and falling) water levels, and time defaults following guidelines established by the U.S. Geological Survey.
24. 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, and time to override. All program settings are reviewed in addition to seeing the review of the completed program.
25. The entire refrigerated sampler is housed in an optional weather-resistant NEMA 3R outdoor enclosure made of fiberglass-reinforced polyester and insulated with 0.75 in (19.05 mm) polyurethane. It is equipped with a full-size gasketed door with lockable latch, duplex outlet, air vents, and access holes for the sampling hose. It shall also include any or all of these (all optional): a heater with thermostat suitable for operation to -40° F (-40° C) outside temperature, a light, and/or fan. The fan is recommended for all applications.
26. This sampler is a Manning Model YB series.

Data Sheet PST 08/24/12
V:3.0

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