



PORTABLE VACUUM SAMPLER · ICE-COOLED

Model VST Portable Vacuum Samplers

Accurate sample collection is critical for permit compliance, plant records, and regulatory audits. Model VST samplers use vacuum technology for excellent volume accuracy and repeatability in discrete or composite sampling, in a rugged, lightweight, field-portable design.

Built for NPDES compliance, industrial pretreatment, combined sewer overflow, storm water, and everyday process control. To manage varying solids, the platform offers two fluid paths: the Model VST3 (3/8-in ID) for standard liquids, and the large-bore Model VST5 (5/8-in ID) for high-solids applications. See the Model Number Configuration section below for ordering codes.



WEIGHT (DRY)	MAXIMUM LIFT	TRANSPORT VEL. (3/8 ID)	BOTTLE CONFIG	SAMPLE ACCURACY
24.5 lbs	28 ft*	5.13 ft/sec	Single/Multi	±0.5% Vol.

*20 ft (6.1 m) lift recommended for general use.



Vacuum Sampling Technology

Vacuum sampling technology collects sample fluids without passing them through a pump, preserving their original state. High transport velocities (2 to 10 ft/s EPA recommended) maintain representative solids suspension. A durable vacuum compressor provides years of precise operation, while reliable components and no consumables minimize maintenance and spare-parts costs. Over 5 ft/s transport velocity enables long horizontal draws unaffected by changing head height, eliminating the need to compensate for draw height or intake line length. Sample volume accuracy and repeatability typically hold within a maximum variance of ±0.5% of the preset volume, regardless of changing environmental variables.



Rugged, Intuitive Controller

Controller and bottle case share a NEMA 4X/NEMA 6 ABS enclosure with stainless steel hardware, built for the conditions samplers actually work in. Data logging, operating-status review, and multiple flow and time modes come standard. A step-by-step menu, dedicated keypad, and large backlit display keep programming fast — even for a technician working by headlamp.



Ice-Cooled Sample Storage

The insulated bottle case holds up to 15 lbs of ice alongside 24 one-liter bottles, maintaining the EPA-recommended 0–4°C sample temperature without a compressor to protect in the field. An average thermal resistance factor of R-12 keeps hold time predictable: roughly $59 \times (\text{lbs ice}) \div \text{average ambient temperature (°C)}$ hours of ice life. Not recommended for use below 32°F.



Single or Multiple Bottle Sampling

Bottle configurations cover single-bottle composite sampling to 24-bottle discrete sampling. A multi-bottle unit is field-convertible to single-bottle using an accessory kit — no special tools required — but a single-bottle unit requires factory conversion to add multi-bottle capability.



Manning VST Portable Sampler — Specifications

Size (H × D)	27.75 in (70.5 cm) high × 17.75 in (45.08 cm) diameter.
Weight (dry)	24.5 lbs (11.1 kg) without battery, with empty sample bottle(s). 12V, 8 Ah battery: 5.5 lb (2.4 kg). 12V, 18 Ah 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; average thermal resistance factor R-12 .
Est. 0–4°C Temperature Time	59 × (lbs ice) / avg temp(°C) = Avg Hours of Ice (less in sun, more in shade).
Temperature Limits	32–120°F (0–48.9°C).
Sample Pump	Diaphragm vacuum compressor pump, 12 VDC. A second compressor can be added for especially demanding applications — special order, factory installed.
Maximum Lift	28 ft (8.53 m) *Over 20 ft
Transport Velocity	5.13 ft/sec @ 5 ft of lift (1.56 m/sec @ 1.5 m), measured with 3/8-in ID hose. EPA recommends 2–10 ft/sec for representative solids suspension.
Sample Volume	500 mL precision chamber per draw; maximum 2,000 mL using multiple chamber fills (up to 4).
Accuracy/Repeatability	±0.5% of set volume or 5 mL, whichever is greater (typical).
Controller	Microprocessor controlled; internal battery backup (5-year typical); hermetically sealed 24-key, multi-function keypad with 2-line × 20-character alphanumeric backlit display. Accurate to 1 min/month.
Power	12VDC: Battery: 8 Ahr, 18 Ahr, Power Supply, 110/220V 60/50 Hz VAC.
I/O	Contact closure; optional 4–20 mA, serial out (RS-232).

*Suction Height/Driving Pressure: 0 ft/14.73 psi, 10 ft/9.3 psi, 20 ft/4.4 psi, 25 ft/1.9 psi. Recommended to 20 ft. Ask about booster pump setups.

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 (time and date)
- Password protection
- Manual test cycle feature
- Activity review log (current and past)
- Intake fault alert
- Intake line purge
- Automatic shut-off
- Power fail / auto restart

Warranty

One year warranty.



Model Number Configuration

VST is a portable vacuum pump sampler system, available in two fluid paths: 3/8-inch ID (Fluid Path 3) for standard liquids, or 5/8-inch ID (Fluid Path 5) for high-solids applications. Select the fluid path along with one option from each category below to build a complete configuration number.

VST

Select one option from each category below, left to right (Fluid Path ID → Sampling Strainer Type), to complete the configuration number.

Fluid Path ID	3 3/8-inch fluid path (VST3) — 5 5/8-inch fluid path (VST5)
Power Source	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 cable included with all samplers.
Battery Charger Type	For use with Power Source options B and C only. 1 None — 2 12V, 800 mA three-stage charger, 110–220 VAC input — 3 12V, 1.8A (high-output) two-stage charger, 110/220 VAC input.
Input/Output Option	A Contact closure input — B A + 4–20 mA — C A + RS-232 — D B + RS-232
Bottle Configuration	A Single bottle (composite sampling) — C Multi-bottle (discrete sampling, 24-bottle distribution)
Bottle Type	1 None — 2 2.5-gal (10 L) polyethylene — 3 5-gal (20 L) polyethylene — 4 4-gal (15 L) polyethylene — 5 2.5-gal (10 L) glass w/PTFE lid liner — 6 1000-mL polyethylene (set of 24, multi-bottle) — 7 500-mL polyethylene (set of 24, multi-bottle) — 8 2.5-gal (10 L) glass w/foam liner cap — 9 5-gal (20 L) polyethylene w/snap-on lids
Sampling Hose Type	VST3 and VST5 share every other category — they differ only in flow-path ID, so hose (and strainer) size is what actually distinguishes the two model numbers. 3/8-in ID (VST3) — PVC: B 10 ft C 25 ft D 50 ft E 100 ft. Solid PTFE: K 10 ft L 25 ft M 50 ft N 100 ft. 5/8-in ID (VST5) — PVC: F 10 ft G 25 ft H 50 ft J 100 ft.
Sampling Strainer Type	1 None — 2 PVC strainer — 3/8-in (VST3) or 5/8-in (VST5) — 3 Stainless steel strainer — 3/8-in (VST3) or 5/8-in (VST5) — 4 Standard Flex strainer, 3/8-in only — 5 Heavy Flex strainer, 3/8-in only <i>No 5/8-in (VST5) Flex strainer has been made — confirmed, not just unavailable on the site.</i>

Manual included with all samplers.



Engineering Specification

Written for direct use in submittals. Plain numbered list, no design elements — copy and paste as needed.

1. The sampler is suitable for automatic collection and preservation of composite or discrete liquid samples.
2. The Model VST is cylindrical in shape and suitable for suspension in 18-inch manholes.
3. The enclosure is a thick-walled ABS with NEMA 4X/NEMA 6 ratings, with stainless steel fittings, carrying handles, and latches.
4. Minimum internal diameter (ID) of all wetted parts is 3/8 inch or 5/8 inch, as ordered. Samples shall be collected using a clear PVC measuring chamber adjustable 20–500 mL sample volume and $\pm 0.5\%$ repeatability of preset value. All wetted parts are stainless steel, PVC, or silicone.
5. The sampler incorporates vacuum compressor technology. The sampling mechanism consists of a heavy-duty vacuum compressor with an aluminum body coated with corrosion-resistant paint. The sample does not pass through a pump. Samplers using technologies requiring regularly scheduled parts replacement will not be acceptable. A 500 mL precision measuring chamber with $\pm 0.5\%$ repeatability of preset volume is used. Multiple draws (up to 4) are possible for a total sample volume of 2,000 mL. There is no need to compensate for changes in draw height or intake line length. A second vacuum compressor can be installed for especially demanding applications — special order, factory installed.
6. The sampler enables field conversion from multiple to single bottle sampling to collect liquids by using a parts kit which does not require special tools. Single-bottle units must be returned to the factory for conversion to multi-bottle.
7. The sampler collects composite and/or discrete samples. For composite sampling, an overflow protection mechanism shall automatically terminate any further sampling. Discrete sampling can be multiple bottles of the same sample or multiple samples in multiple bottles.
8. 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.
9. The sampler is capable of collecting 20–2000 mL samples through a 3/8-inch ID sample line at a minimum transport velocity of 2.5 ft/sec at 20 ft of lift using a 25-foot sampling hose, and 5.13 ft/sec at 5 ft of lift using a 15-foot hose. Maximum rated lift is 28 ft (8.53 m); 20 ft (6.1 m) is recommended for general use.
10. An optional weighted sampling strainer of PVC or stainless steel is used.
11. A hermetically sealed 24-button keypad and a 2-line by 20-character alphanumeric backlit display is linked to a programmable CPU.
12. The sampler is powered by: a) an external 12-volt, 8-amp-hour lead acid battery; b) an optional external 12-volt, 18-amp-hour lead acid battery; or c) an optional external 110–220 VAC power supply.
13. An optional external battery charger can trickle charge the sampler battery while the sampler is operating. The charger is a) a standard-output rapid/float three-stage charger for 110–220 VAC operation, providing 12 VDC @ 800 mA, or b) a high-output rapid/float two-stage charger for 110/220 VAC operation, providing 12 VDC @ 1.8A.
14. No unique symbols or codes for programming, or to indicate operating conditions, are used. The software is menu driven, prompting input of requested information by 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 is used to restrict 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 (up to 99 hrs, 59 min), or the number of contact closures to occur. The delay is independent of the sampling interval.
17. The sampler purges the sampler hose immediately prior to and following each sample. Purge duration is selectable from 3–99 seconds. 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.
18. Manual sampling, independent of a programmed sequence, is initiated by a keystroke. 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 sample is not counted as a sample, or c) during a program and the test sample is counted as a sample.
19. In the Time Mode, the interval between samples is adjustable (1–5999 min. in 1-minute increments). In the Flow Mode, the sampler accepts and totalizes contact closures (1–9999) or a 4–20-mA DC analog signal input for sampling at a user set point.
20. The sampler uses a hydrologic event algorithm to enable sample programming based on a combination of parameters, including water level, differential (rising and falling) water levels, and time defaults as established for hydrologic events by the U.S. Geological Survey.
21. Operating status is reviewed with minimal effort and includes: a) program status, b) time and date program started, c) minutes or flow signals remaining to the next sample, d) bottle number, e) number of samples collected, f) number of samples remaining, g) volume collected, and h) volume remaining.
22. All program settings are reviewed, followed by a review of the completed program.
23. An optional suspension harness allows the sampler to be hung in manholes and other confined or tight spaces for portable, transportable field deployment.
24. The sampler is a Manning Model VST series.

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