



## STATIONARY VACUUM SAMPLER · REFRIGERATED

### Model VSR Stationary Vacuum Sampler (Refrigerated)

Accurate sample collection is critical for permit compliance, plant records, and regulatory audits. Model VSR samplers use vacuum technology for excellent volume accuracy and repeatability in discrete or composite sampling.

Designed for municipal and industrial market with durability and versatility, the VSR handles everyday process control and demanding scientific studies. To manage varying solids, the platform offers two fluid paths: the Model VSR3 (3/8-in ID) for standard liquids, and the large-bore Model VSR5 (5/8-in ID) for high-solids applications like pulp mills. See the Model Number Configuration section below for ordering codes.



| AMBIENT RANGE | FLUID PATH    | TRANSPORT VEL. | BOTTLE CONFIG | SAMPLE ACCURACY |
|---------------|---------------|----------------|---------------|-----------------|
| 32–110°F*     | 3/8 or 5/8 ID | 5.13 ft/sec    | Single/Multi  | ±0.5% Vol.      |

\* Extends to -40°F with the optional heated Fiberglass Sampler Enclosure (73i or 53i, NEMA 3R rated).



#### 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 (100 ft) unaffected by changing head height, eliminating the need to compensate for draw height or intake line length.



#### Versatile Controller

Engineered for the harsh environments where samplers actually operate, the microprocessor-based controller is housed in a heavy-duty NEMA 4X / NEMA 6 weather-proof enclosure. The interface features a large, backlit LCD and a dedicated tactile keypad, allowing rapid programming and parameter adjustments, even for an operator wearing gloves. A straightforward, step-by-step menu structure eliminates the frustration of digging through complex, nested settings. Advanced data logging, real-time operating-status reviews, and flexible pacing options (including multiple flow and time modes) all come standard to easily integrate with your plant's pacing signals.



#### Accurate, Repeatable Sample Volumes

Sample volume accuracy and repeatability typically hold within a maximum variance of ±0.5% of the preset volume. In routine operation, actual sample volume varies by only a few milliliters, regardless of changing environmental variables. This accurate and highly repeatable delivery ensures that you can trust your composite samples are correctly weighted and representative.



#### 5.5 cu. ft. (156 L) Refrigerator

Available in Digital and Non-Digital control versions for protected, indoor, or sheltered installations, it holds samples at the EPA-recommended 0–4°C across a 32–110°F (0–43.3°C) ambient range. Housed in the 53i or 73i optional heated Fiberglass Sampler Enclosure, that range extends down to -40°F (-40°C) for outdoor or unprotected sites.



### Manning VSR Refrigerated Sampler — Specifications

|                                           |                                                                                                                                                                                                                                           |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Size (H × W × D)</b>                   | Controller <b>17.75 in diameter × 16 in high</b> (45.1 × 40.6 cm); Refrigerator 5.5 cu. ft. <b>23.63 × 33.5 × 23.5 in</b> (600 × 851 × 597 mm)<br>Optional Enclosure: 73i – H 73.5 × W 32.2 × D 29.9 in / 53i – H 55 × W 29 × D 28.88 in  |
| <b>Weight (dry)</b>                       | Sampler, single bottle: <b>117.5 lbs</b> (53.30 kg). Refrigerator (5.5 cu. ft.): <b>100 lbs</b> (45 kg). Multi-bottle assembly: <b>15.6 lbs</b> (7.08 kg). Weights vary with size and material; all weights exclude packaging or pallets. |
| <b>Environmental Protection (sampler)</b> | NEMA 4X/NEMA 6 ABS housing around electromechanical components, with stainless steel hardware.                                                                                                                                            |
| <b>Refrigeration</b>                      | Maintains samples at <b>0–4°C (32–39°F)</b> . Epoxy coated copper lines.                                                                                                                                                                  |
| <b>Temperature Limits</b>                 | Standard unit: <b>32–110°F (0–43.3°C)</b> . With optional Fiberglass Sampler Enclosure, heater & fan (NEMA 3R): <b>-40–110°F (-40–43.3°C)</b> .                                                                                           |
| <b>Sample Pump</b>                        | Diaphragm vacuum compressor pump, 12 VDC. A second compressor can be added for especially demanding applications (special order).                                                                                                         |
| <b>Maximum Lift</b>                       | <b>28 ft (8.53 m)</b> *Over 20 ft                                                                                                                                                                                                         |
| <b>Transport Velocity</b>                 | <b>5.13 ft/sec @ 5 ft of lift</b> (1.56 m/sec @ 1.5 m), measured with 3/8-in ID hose. EPA recommends 2–10 ft/sec for representative solids suspension.                                                                                    |
| <b>Sample Volume</b>                      | <b>20–500 mL</b> per draw; maximum 2,000 mL using multiple chamber fills (up to 4).                                                                                                                                                       |
| <b>Accuracy/Repeatability</b>             | <b>±0.5%</b> of set volume or <b>5 mL</b> , whichever is greater (typical).                                                                                                                                                               |
| <b>Controller</b>                         | Microprocessor controlled; internal battery backup (5-year typical); hermetically sealed 24-key, multi-function keypad with 2-line × 20-character alphanumeric backlit LCD. Accurate to 1 min/month.                                      |
| <b>Power</b>                              | Controller: <b>110/220 VAC, 50/60 Hz</b> . Refrigerator: <b>110 VAC (60 Hz)</b> only. Optional battery backup available (controller only, not refrigerator).                                                                              |
| <b>Alarm Contacts</b>                     | Three SPST, <b>5 A 110/220 VAC</b> (optional).                                                                                                                                                                                            |
| <b>I/O</b>                                | 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

VSR is a stationary 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.

|     |  |  |  |  |  |  |  |  |  |  |
|-----|--|--|--|--|--|--|--|--|--|--|
| VSR |  |  |  |  |  |  |  |  |  |  |
|-----|--|--|--|--|--|--|--|--|--|--|

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

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fluid Path ID            | <b>3</b> 3/8-inch fluid path (VSR3) — <b>5</b> 5/8-inch fluid path (VSR5)                                                                                                                                                                                                                                                                                                                                                                            |
| Power Requirement        | <b>A</b> 110 VAC — <b>C</b> Battery Backup — 110 VAC (for sampler only, not refrigerator)                                                                                                                                                                                                                                                                                                                                                            |
| Refrigerator             | <b>1</b> None — <b>7</b> 5.5 cu.ft., White, 110 VAC, Non-Digital — <b>9</b> 5.5 cu.ft., White, 110 VAC, 60 Hz, Digital controls                                                                                                                                                                                                                                                                                                                      |
| Input/Output Option      | <i>3-ft input cable included with all units; RS-232 patch cable included when applicable.</i><br><b>A</b> Contact closure input — <b>B</b> A + 4–20 mA — <b>C</b> A + RS-232 — <b>D</b> B + RS-232                                                                                                                                                                                                                                                   |
| Bottle Configuration     | <b>A</b> Single bottle (composite sampling) — <b>C</b> Multi-bottle (discrete sampling, 24-bottle distribution)                                                                                                                                                                                                                                                                                                                                      |
| Bottle Type              | <b>1</b> None — <b>2</b> 2.5-gal (10 L) polyethylene — <b>3</b> 5-gal (20 L) polyethylene — <b>4</b> 4-gal (15 L) polyethylene — <b>5</b> 2.5-gal (10 L) glass w/PTFE lid liner — <b>6</b> 1000-mL polyethylene (set of 24, multi-bottle) — <b>7</b> 500-mL polyethylene (set of 24, multi-bottle) — <b>8</b> 2.5-gal (10 L) glass w/foam liner cap — <b>9</b> 5-gal (20 L) polyethylene w/snap-on lids                                              |
| Sampling Hose Type       | A — None, connector only. VSR3 and VSR5 share every other category — they differ only in flow-path ID, so hose (and strainer) size is what actually distinguishes the two model numbers.<br>3/8-in ID (VSR3) — PVC: <b>B</b> 10 ft <b>C</b> 25 ft <b>D</b> 50 ft <b>E</b> 100 ft. Solid PTFE: <b>K</b> 10 ft <b>L</b> 25 ft <b>M</b> 50 ft <b>N</b> 100 ft.<br>5/8-in ID (VSR5) — PVC: <b>F</b> 10 ft <b>G</b> 25 ft <b>H</b> 50 ft <b>J</b> 100 ft. |
| Sampling Strainer Type   | <b>1</b> None — <b>2</b> PVC strainer — 3/8-in (VSR3) or 5/8-in (VSR5) — <b>3</b> Stainless steel strainer — 3/8-in (VSR3) or 5/8-in (VSR5) — <b>4</b> Standard Flex strainer, 3/8-in only — <b>5</b> Heavy Flex strainer, 3/8-in only<br><i>No 5/8-in (VSR5) Flex strainer has been made — confirmed, not just unavailable on the site.</i>                                                                                                         |
| Environmental Protection | <b>A</b> None — <b>K</b> 73i Fiberglass Sampler Enclosure w/Fan — <b>L</b> 73i w/Heater, Light & Fan — <b>N</b> 73i w/Heater & Fan — <b>P</b> 73i w/Light & Fan — <b>U</b> 53i w/Fan & Heater — <b>V</b> 53i w/Fan<br><i>All 110 VAC, 60 Hz, NEMA 3R rated. 73i and 53i are the same enclosure design in two sizes — they operate identically and differ only in footprint.</i>                                                                      |
| Alarms                   | <b>1</b> None — <b>2</b> Three alarm contacts (sample in progress, missed sample, bottle-full / end-of-sample)                                                                                                                                                                                                                                                                                                                                       |

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 enclosure is a thick-walled ABS with NEMA 4X/NEMA 6 ratings.
3. 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.
4. 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).
5. 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.
6. 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.
7. 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.
8. 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.
9. An optional weighted sampling strainer of PVC or stainless steel is used.
10. A hermetically sealed 24-button keypad and a 2-line by 20-character alphanumeric backlit LCD is linked to a programmable CPU.
11. Refrigeration: The Refrigerator is a 5.5 cu. ft. (156 L) unit for protected-from-the-elements, indoor, or sheltered applications only, available in Digital and Non-Digital control versions, with a foam-insulated cabinet and white-finished steel exterior. It maintains the EPA-recommended temperature of 0–4°C within a 32–110°F (0–43.3°C) ambient operating range. Refrigerant: R600a. Compressor: 461-BTU, approximately 0.8 A draw.
12. 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.
13. A password feature is used to restrict access to authorized persons only.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. All program settings are reviewed, followed by a review of the completed program.
21. The entire refrigerated sampler may be housed in an optional weather-resistant Fiberglass Sampler Enclosure (NEMA 3R rated), available in two sizes (73i and 53i) that operate identically and differ only in footprint, made of fiberglass-reinforced polyester and insulated with 0.75 in. (19.05 mm) thick polyurethane. It is equipped with a full-sized gasketed door with lockable latch, duplex electrical outlet, air vents, and access holes for the sampling hose. It also includes any or all of the following (all optional): a heater with thermostat suitable for sampler operation to -40°F (-40°C) outside temperature, a light, and/or a fan.
22. The sampler is a Manning Model VSR series.

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