

## Model S5000 & S5200 Stationary Composite Vacuum Samplers (Refrigerated)

### 💧 Representative Samples

Vacuum samplers have been supported in multiple tests as a superior form of sampling, providing the most representative samples. The most comprehensive and commonly cited sampling study is the Harris Keffer report. Their findings were supported in the Department of Transportation test conducted by the United States Geological Survey in Madison Wisconsin.

### 💧 Reliable

The S-5000 and the S-5200 are extremely durable samplers. The rugged construction and field-proven reliability of these units mean years and years of dependable service. They routinely last over 20 years. See our Decade Club online.

### 💧 Easy to use

Straightforward in design, these samplers are easy to use. How often do you require only the basic functions, but get a complicated unit that is difficult to use and requires significant training?



S-5200 with Totalizers



### 💧 Suspended Solids Performance

Are you losing suspended solids? The Harris Keffer report again supports vacuum samplers. The report states as follows:

“The comparison studies indicated that the high vacuum, high liquid intake velocity samplers were more effective in capturing solid material. Although these units also produced higher concentrations disproportionately greater, it would appear that of BOD and COD, the increase in the NFS was the slower acting peristaltic and piston pump type samplers are either not capturing settleable [sic] materials or that after introduction to the intake line, particle setting velocities are higher than liquid intake velocities. Another factor could be the agitation of the sample increments during collection. The greater intake velocities of those compositors, which have yielded high strength samplers, may be breaking up larger size suspended material as the aliquot passes through the sampling train and into the collection container.”



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## 💧 Accurate Repeatable Volumes

If the sample volume varies, then the data in a composite sample routine will be offset. The 5000 series samplers deliver a minimum accuracy of  $\pm 0.5\%$  of the set volume. A peristaltic sampler is affected by head height, tube wear and other changing conditions. Vacuum samplers maintain their accuracy independent of head height and other changing conditions and do not require the costly regular replacement of pump tubing.

## 💧 5/8-inch Intake path

These units are a favorite of paper mills and municipal applications where the suspended solids can be a major problem. The larger intake path and high-pressure purge keep the intake path clear.

## 💧 Trouble-free Controller

Reliable for the last 30 years, the S-5000 and S-5200 controllers have been updated electronically for even greater reliability.

## 💧 Cost Over Time

Why do people pay more for quality in the beginning? For the simple reason that over time the cost is less. Low maintenance, virtual elimination of downtime, ease of use and operation, little or no required training, no consumable parts, and the over-all reliability of the product mean you continue to save money each year of ownership. With budgets shrinking and equipment costs increasing, it's important to invest in a unit that will provide exceptional long-term value.

## 💧 Totalizer Option

The totalizer has been updated with a new display and new features, although it continues with the simplistic theme. The totalizer option uses a 4-line by 20-character backlit LCD with simple on-screen menus. For accurate measurements of the 4-20-mA signal, the design incorporates a 10-bit analog to digital converter. The S-5200 allows for the use of one or two totalizers.

## 💧 S-5000 and S-5200

The S-5000 and the S-5200 are manufactured from the same basic design. The S-5000 is a dual sampler, functioning as if there were two S-5000 independently controlled samplers operating in the same enclosure and depositing separate samples in the same refrigerator.



**S-5200 Dual Measuring Chambers**

## 💧 Refrigerator Options: 4.1 Cubic Ft. or 6.1 Cubic Ft. Refrigerator

The 4.1 cu. ft. refrigerator was proudly introduced in Spring 2005. This unit is offered as an economical alternative to the standard (6.1 cu. ft.) refrigerator and can be used with the Manning S-5000 single bottle (composite) samplers. The 6.1 cu. ft. refrigerator is advisable for tougher environments and/or multiple bottle use.

\*Please use the Refrigerator Data Sheets to compare the 4.1 and the 6.1 cubic ft. refrigerators.



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## Manning S5000 and S5200 Refrigerated Sampler

### Specifications

<b>Dimensions:</b>	Refrigerators: 6.1 Cubic Ft. Refrigerator: W 23.875 in. (60.65 cm) x H 34.5 in. (87.63 cm) x D 24 in. (60.96 cm) 4.1 Cubic Ft. Refrigerator: W 10.38" (49.25 cm) x H 33.25" (84.46 cm) x D 22" (55.88 cm)
<b>Weight: (dry)</b>	Enclosure Only: S-5000: 56.5 lbs (25.62 kg) Refrigerators: 6.1 Cubic Ft. Refrigerator: 110 lbs (49.9 kg). 4.1 Cubic Ft. Refrigerator: 57 lbs (25.85 kg)
<b>Sampler Transport Velocity:</b>	5/8 inch ID hose: 9.75 liters per minute @ 5 ft of lift
<b>Maximum sampler lift:</b>	28 ft (8.53 m)*
<b>Suction Hose:</b>	Flexible nylon-reinforced PVC or clear PVC, 1.6 cm (5/8 inch ID in standard lengths of 10, 25, 50, or 100 feet.)
<b>Sample Volume</b>	The measuring chamber(s) can be adjusted to hold 20 ml to 1 L, reproducible to $\pm 0.5\%$ . The controller provides both flow-proportional and time control. In the dual composite sampler, the S-5200, separate controllers are supplied for each chamber in a single enclosure on one refrigerator.
<b>Controller:</b>	Flow-proportional Control (Standard): Sample cycle is initiated by a dry contact closure (0.25 sec) from an external flow meter. Time Control (Standard): Clock controlled time intervals of 3.75, 7.5, 15, or 30 minutes, 1, 2, 4, 6, 12, or 24 hours, switch selectable with better than $\pm 0.03\%$ accuracy. <b>Optional:</b> Flow Signal Totalizer Control: Adds the capability to accept a 4–20-mA signal representing flow.
<b>Sample Cycle Program:</b>	Purge, draw sample, measure sample, deposit. The maximum draw times are either 30 seconds or 90 seconds, depending upon a jumper setting. The sampler attempts to draw the sample twice during each sample cycle.
<b>Purge Pressure</b>	Minimum of 35 psi (2.46 kg/cm <sup>2</sup> )
<b>Temperature Limits:</b>	32–120°F (0–49°C)

### Enclosures

The standard enclosure is NEMA 12 and rated for indoor installation. The metal enclosure is coated with a polyurethane finish. Controls are panel mounted at a convenient height within the cabinet with a gasketed, key lock door. Dimensions of the sampler enclosure only are 24" x 22" x 19" (S-5200) and 20" x 22" x 14.5" (S-5000).

**Optional:** NEMA 3R fiberglass enclosure (suitable for outdoor installation) is 4X with vents closed. A full-sized fiberglass-reinforced polyester enclosure with 1.9 cm (0.75 in.) polyurethane insulation encapsulated in the walls, floor, and ceiling with dimensions of 183 cm H x 81 cm W x 76 cm D (72" H x 32" W x 30" D). A gasketed, lockable door is included. A fan, light, and heater with thermostat are available as options. The temperature range with this enclosure is -20–120° F. For more information, please see the NEMA 3R Data Sheet. NEMA 3R is best suited for S-5000; Consult factory for use with an S-5200.

### Refrigeration:

Capable of maintaining the sample bottle compartment at 0–4°C for ambient temperatures to 49°C (120°F). The 6.1 Cubic Ft. Refrigerator is available in white enamel-coated or stainless steel finish. For indoor/sheltered use, the 4.1 Cubic Ft. Refrigerator is available for the S-5000 only and can maintain 0–4°C within an ambient temperature range of 40–110°F (4.44–43.34°C).

### Sampler Bottles

Poly-ethylene bottles for composite sampling are available in 2.5 gal, 4.0 gal and 5.0 gal. A 2.5 gal glass bottle with cap and Teflon® liner is also available.

### Power

110 VAC, 60 Hz, 20 A service recommended. 6.1 Cubic Ft. Refrigerator: 110 VAC, 60 Hz, 3.3 A when running. 4.1 Cubic Ft. Refrigerator: 115 VAC, 60 Hz, 1.4 A when running. S-5000: 110 VAC, 60 Hz, 5 A. S-5200: 110 VAC, 60 Hz, 10 A.

### Warranty

**One year from date of shipment.**

### Accessories

#### S 5000 and S5200

<ul style="list-style-type: none"> <li>• <b>Replacement Bottles</b> 2.5-gallon poly-ethylene bottle w/cap P/N 687547 4-gallon poly-ethylene bottle w/cap P/N 687551 5-gallon poly-ethylene bottle w/cap P/N 687535 2.5-gallon glass bottle w/Teflon® lid liner P/N 889715 5-gallon poly-ethylene container with snap-on lids P/N 889721 (Fits S-5000 Only)</li> <li>• <b>Pressure Switch</b> Pressure switch assembly P/N 638522</li> <li>• <b>Strainers</b> 5/8-inch PVC strainer P/N 889148 5/8-inch Stainless Steel strainer P/N 579584</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Replacement Intake Hose</b> 5/8-inch clear bulk intake hose (by the foot) P/N 566918 5/8-inch nylon-reinforced bulk intake hose (by the foot) P/N 566901</li> <li>• <b>Replacement Pinch/Discharge Tubing</b> 5/8-inch silicone (by the foot) P/N 566899</li> <li>• <b>Hose Couplings</b> 5/8-inch female hose coupling P/N 552030</li> <li>• <b>Manual</b> Manual for S-5000 P/N 717660 Manual for S-5200 P/N 717659</li> </ul>
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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 for S-5000 Composite Sampler

## MODEL NUMBER

**S50** Stationary Composite Vacuum Sampler 115 VAC, 60 Hz

### CONTROLLER

- A 30-second Maximum Draw Time
- B Flow with 90-second Maximum Draw Time

### INPUT/OUTPUT OPTION

- 1 Contact closure
- 2 Totalizer

### REFRIGERATOR

- A None
- B 6.1 cubic ft., white, 110 VAC, 60 Hz
- C 6.1 cubic ft., stainless steel, 110 VAC, 60 Hz (Stainless Steel)
- D 4.1 cubic ft., white, 115 VAC, 60 Hz\*

\* Single bottle applications, protected from the elements, indoors, or in a shelter only. See 4.1 Cubic Ft. Refrigerator Data Sheet.

### BOTTLE TYPE

- |                          |  |
|--------------------------|--|
| 1 None                   | 4 2.5-gallon poly-ethylene                           |
| 2 5-gallon poly-ethylene | 5 2.5-gallon glass w/Teflon cap                      |
| 3 4-gallon poly-ethylene | 9 5-gallon poly-ethylene container with snap-on lids |

### SAMPLER HOSE TYPE

- |                               |  |
|-------------------------------|--|
| A Connector – no hose         | F Nylon-reinforced PVC 5/8-inch hose – 10 ft.  |
| B PVC 5/8-inch hose – 10 ft.  | G Nylon-reinforced PVC 5/8-inch hose – 25 ft.  |
| C PVC 5/8-inch hose – 25 ft.  | H Nylon-reinforced PVC 5/8-inch hose – 50 ft.  |
| D PVC 5/8-inch hose – 50 ft.  | I Nylon-reinforced PVC 5/8-inch hose – 100 ft. |
| E PVC 5/8-inch hose – 100 ft. |  |

### STRAINER TYPE

- 1 None
- 2 PVC strainer
- 3 Stainless steel strainer

### ENVIRONMENTAL PROTECTION\*

- A None
- C NEMA 3R fiberglass insulated enclosure with fan
- D NEMA 3R fiberglass insulated enclosure with fan and heater
- E NEMA 3R fiberglass insulated enclosure with fan and light
- F NEMA 3R fiberglass insulated enclosure with fan, light and heater

### ALARM OPTION\*

- A None
- D Three alarms with 3 lamps

\* Alarm contacts consist of Sample Cycle, Missed Sample, and Bottle Full.

### AUDIO INDICATOR (Alarm Option required)\*

- 1 None
- 2 Audio Indicator (Alarm Option D required)

\* Specify alarm to which audio indicator should be wired.

Manual included with all units.

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**Configuration Number**

Select one of each category

# Ordering Information for S-5200 Dual Composite Stationary Sampler

**MODEL NUMBER**

**S52** Dual Chamber Stationary Composite Vacuum Sampler 115 VAC, 60 Hz

**CHAMBER #1 CONTROLLER**

- A** 30-second Maximum Draw Time
- B** 90-second Maximum Draw Time

**CHAMBER #2 CONTROLLER**

- A** Time and Flow with 30-second Maximum Draw Time
- B** Time and Flow with 90-second Maximum Draw Time

**INPUT/OUTPUT OPTION**

- 1** Contact closure
- 2** Single Totalizer (connected to chamber #1 controller)
- 3** Dual Totalizer (each chamber controller has a Totalizer)

**REFRIGERATOR**

- A** None
- B** 6.1 cubic ft., white, 110 VAC, 60 Hz refrigerator
- C** 6.1 cubic ft., stainless steel, 110 VAC, 60 Hz refrigerator

**BOTTLE TYPE**

- 1** None
- 2** 5-gallon polyethylene (2 each)
- 3** 4-gallon polyethylene (2 each)
- 4** 2.5-gallon polyethylene (2 each)
- 5** 2.5-gallon glass w/Teflon® cap (2 each)

**SAMPLER HOSE TYPE**

- A** Connector – no hose
- B** PVC 5/8-inch hose – 10 ft (2 each)
- C** PVC 5/8-inch hose – 25 ft (2 each)
- D** PVC 5/8-inch hose – 50 ft (2 each)
- E** PVC 5/8-inch hose – 100 ft (2 each)
- F** Nylon-reinforced PVC 5/8-inch hose – 10 ft (2 each)
- G** Nylon-reinforced PVC 5/8-inch hose – 25 ft (2 each)
- H** Nylon-reinforced PVC 5/8-inch hose – 50 ft (2 each)
- I** Nylon-reinforced PVC 5/8-inch hose – 100 ft (2 each)

**STRAINER TYPE**

- 1** None
- 2** PVC strainer
- 3** PVC strainers (2 each)
- 4** Stainless steel strainer
- 5** Two stainless steel strainers (2 each)

**ENVIRONMENTAL PROTECTION\***

- A** None
- C** NEMA 3R fiberglass insulated enclosure with fan
- D** NEMA 3R fiberglass insulated enclosure with fan and heater
- E** NEMA 3R fiberglass insulated enclosure with fan and light
- F** NEMA 3R fiberglass insulated enclosure with fan, light and heater

**ALARM OPTION\***

- A** None
- D** Three alarms with 3 lamps
- G** 2 each of Option D (one for each chamber)

\* Alarm contacts consist of Sample Cycle, Missed Sample, and Bottle Full.

**AUDIO INDICATOR (Alarm Option required)\***

- 1** None
- 2** Audio Indicator (Alarm Option D required)
- 3** 2 each Audio Indicators (Alarm Options D or G required)

\* Specify alarm to which audio indicator should be wired.

Manual included with all units.

S52									
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**Configuration Number**

Select one of 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 S5000 & S5200**  
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**V5.0**

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