

Model S-5000 and S-5200 Stationary Composite Vacuum Samplers (Refrigerated)



S-5000 Front View



S-5000 with 6.1 Cubic Ft. Refrigerator



S-5200 with Totalizers

◆ 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.

◆ The Environmental Protection Agency's Recommendation

The Harris Keffer report states: *"Although the results of the sampler comparison studies are not conclusive, it is the opinion of the Field Investigations Section that high-vacuum, sampling equipment produces more representative samples. On waste sources with appreciable concentrations of large and/or heavy settleable [sic] material such as raw municipal wastewater, the section makes every effort to install a high vacuum unit when compatible with site conditions and data requirements. Since these units yield higher results, they are of advantage to treatment plants in determination of removal efficiencies."*

◆ Suspended Solids Performance

Are you losing suspended solids? The Harris Keffer report again supports vacuum samplers. The report states: "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 of BOD and COD, the increase in the NFS was disproportionately greater. It would appear that 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 settling 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. In the laboratory, suspension of smaller sized particle would be more amendable to extraction of representative amounts of residue with routine pipetting procedures."

◆ Reliable

The S-5000 is one tough sampler. The rugged construction and the field-proven reliability of this system mean years and years of dependable service. S-5000 and S-5200 units in daily use routinely last over 20 years. Check out our Decade Club online.

◆ Easy to Use

Straightforward in design, these samplers are easy to use. How often do you want a sampler that does the basic functions, but get a complicated unit that is difficult to use and requires significant training? The 5000 series provides you with time and flow-based sampling. It's so easy that even the new guy won't have any problems!

◆ High Transport Velocity

Why does the EPA recommend high transport velocity? If you had a cup of water with particles settling out in the bottom, the quicker you can get that cup to your composite bottle the more representative it will be. The same is true for getting your sample volume to the bottle. The S-5000 and S-5200 both offer the high transport velocity of a Manning vacuum pump with a 5/8" line: 9.75 liters per minute!

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WATER and WASTEWATER SAMPLERS

◆ Accurate Repeatable Volumes

If your sample volume varies, then your 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 tubing.

◆ 5/8-inch Intake path

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

◆ Trouble-free Controller

Reliable from the beginning, the S-5000 and S-5200 controllers have been updated after 30 years to continue the tradition of trouble-free use. A sampler that works well, so well that it's still very effective after 30 years, is a sampler you can rely on.



S-5000 with 4.9 Cubic Ft. Refrigerator

◆ 6.1 Cubic Ft. Refrigerator

This optional 110 VAC refrigerator, offered in white enamel-coated or stainless steel finish, is durable and corrosion resistant. Capable of maintaining samples at the EPA-recommended 0–4° C even in high ambient temperatures, this industrial-grade refrigerator is built to handle the toughest environments. Features such as a corrosion-resistant frame and exterior, all copper refrigerant lines wrapped with asphalt cork tape to resist damaging gases, evaporation coils with corrosion-resistant finish, and a heavy-duty compressor with a fan-cooled heat exchanger, ensure reliable operation even in harsh conditions.

◆ 4.9 Cubic Ft. Refrigerator

Proudly introduced in Spring 2005, this unit is offered as an economical alternative to the standard refrigerator and can be used with the Manning S-5000 single bottle (composite) samplers. This refrigerator will maintain the EPA-recommended temperature of 0–4° C as long as the ambient air temperature is within the range of 39–110° F (3.89–43.33° C).^{*} Aimed at single-bottle, sheltered, indoor, or protected-environment applications, this clever choice will appeal to the money-saving measures needed to survive today's budget cuts and cost-reduction programs.

^{}Please see the 4.9 Cubic Ft. Refrigerator Data Sheet for more specifications.*

◆ 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.

◆ 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.



S-5200 Dual Measuring Chambers

◆ S-5000 and S-5200

The S-5000 and the S-5200 are manufactured from the same basic design. The S-5200 is a dual sampler, functioning as if there were two S-5000s side by side. Two independently controlled samplers operate in the same enclosure and deposit samples to separate bottles in the same refrigerator. This saves on cost if you have two sites in close proximity and saves labor to only have collection from one location.

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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.

Specifications

Dimensions:	Enclosure Only: S-5000: 21.5 in. (54.6 cm) H × 20 in. (50.8 cm) W × 14.75 in. (37.47 cm) D without refrigerator, mounting bars, or door latch. S-5200: 21.5 in. (54.6 cm) H × 24 in. (60.9 cm) W × 19.5 in. (49.53 cm) D without refrigerator, mounting bars, or door latch. Refrigerators: 6.1 Cubic Ft. Refrigerator: W 23.875 in. (60.65 cm) × H 34.5 in. (87.63 cm) × D 24 in. (60.96 cm) 4.9 Cubic Ft. Refrigerator: W 21.25" (53.98 cm) × H 33.5" (85.09 cm) × D 23" (58.42 cm)
Weight:	Enclosure Only: S-5000: 56.5 lbs (25.62 kg) Refrigerators: 6.1 Cubic Ft. Refrigerator: 110 lbs (49.9 kg). 4.9 Cubic Ft. Refrigerator: 50.5 lbs (22.91 kg)
Sampler Transport Velocity:	5/8 inch ID hose: 9.75 liters per minute @ 5 ft of lift
Maximum sampler lift:	28 ft (8.53 m)*
Suction Hose:	Flexible nylon-reinforced PVC or clear PVC, 1.6 cm (5/8 inch ID in standard lengths of 10, 25, 50, or 100 feet.)
Sample Volume:	The measuring chamber(s) can be adjusted to hold 20 ml to 1 L, reproducible to ±0.5%.
Controller:	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. 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 ±0.03% accuracy. Optional: Flow Signal Totalizer Control: Adds the capability to accept a 4–20-mA signal representing flow.
Sample Cycle Program:	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.
Purge Pressure:	Minimum of 35 psi (2.46 kg/cm ²)
Temperature Limits:	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" × 22" × 19" (S-5200) and 20" × 22" × 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 × 81 cm W × 76 cm D (72" H × 32" W × 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 4.9 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). The 4.9 Cubic Ft. Refrigerator is only available in black enamel-coated finish.
Sample Bottles:	Polyethylene 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. 4.9 Cubic Ft. Refrigerator: 120 VAC, 60 Hz, 0.9 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. *Dual compressors required. Consult factory.

Accessories

- **Replacement Bottles**
 - 2.5-gallon polyethylene bottle w/cap P/N 687547
 - 4-gallon polyethylene bottle w/cap P/N 687551
 - 5-gallon polyethylene bottle w/cap P/N 687535
 - 2.5-gallon glass bottle w/Teflon® lid liner P/N 889715
 - 5-gallon polyethylene container with snap-on lids P/N 889721 (Fits S-5000 Only)
- **Pressure Switch**
 - Pressure switch assembly P/N 638522
- **Strainers**
 - 5/8-inch PVC strainer P/N 889148
 - 5/8-inch Stainless Steel strainer P/N 579584
- **Replacement Intake Hose**
 - 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
- **Replacement Pinch/Discharge Tubing**
 - 5/8-inch silicone (by the foot) P/N 566899
- **Hose Couplings**
 - 5/8-inch female hose coupling P/N 552030
- **Manual**
 - Manual for S-5000 P/N 717660
 - Manual for S-5200 P/N 717659

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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 4.9 cubic ft., black, 110 VAC, 60 Hz*

* Single bottle applications, protected from the elements, indoors, or in a shelter only. See 4.9 Cubic Ft. Refrigerator Data Sheet.

BOTTLE TYPE

- | | |
|-------------------------|---|
| 1 None | 4 2.5-gallon polyethylene |
| 2 5-gallon polyethylene | 5 2.5-gallon glass w/Teflon cap |
| 3 4-gallon polyethylene | 9 5-gallon polyethylene 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

Configuration Number

Select one of each category

Engineering Specifications

S-5000 Composite Sampler

1. The sampler shall incorporate the vacuum compressor technique of sampling, with the sampling mechanism consisting of a heavy-duty compressor, one-liter measuring chamber, control circuitry, and all necessary valving for proper operation. All components shall be panel-mounted in a heavy-gauge housing with the sampler container located below in a refrigerated compartment maintained at 0–4° C. The sampler housing shall comply with the Nema 12 specification.
2. The sampler shall be capable of drawing up to one-liter samples through a 1.6 cm (5/8 inch) inside diameter (ID) inlet hose at a sample velocity of 9.75 liters per minute at 5 ft. of lift to assure a representative sample.
3. The samples shall be collected in a clear measuring chamber with the sample volume adjustable from 20 ml to 1 L. The sample shall be drawn into the chamber through a minimum 5/8 inch (1.6 cm) ID nylon-reinforced PVC or clear PVC sample hose.
4. All portions of the fluid path shall be nonmetallic in order to withstand most acids and bases, and to avoid sample contamination. No liquid sample shall pass through any pump.
5. In the event the first attempt to take a sample is prevented due to clogging, a second sample cycle shall be automatically instituted.
6. The sampler shall be capable of operating on a flow-proportional basis as controlled by a contact closure from an external flow meter or by an optional 4–20-mA flow rate signal with fully adjustable sample rate control.
7. The unit shall also be capable of operating on a time-control basis by the use of clock circuitry with a switch-selectable setting from 3.75 minutes to 24 hours.

Optional: The entire sampler, control cabinet and refrigeration unit, shall be enclosed in a weather resistant NEMA 3R outdoor enclosure. The enclosure shall be of fiberglass-reinforced polyester with a minimum 750 in. (1.9 cm) thick polyurethane insulation encapsulated in the walls, ceiling and floor. A full size, heavily gasketed door with lockable latch shall be included. An optional heater with thermostat suitable for operation of sampler to -40° F (-40° C) shall be installed in the enclosure.

8. Refrigeration: The **6.1 Cubic Ft. Refrigerator** is composed of carbon steel (with iron phosphate pretreatment, covered by white baked acrylic enamel) or stainless steel. The refrigerator condenser is made of carbon steel with a baked enamel finish. Copper refrigerant lines are coated with asphalt cork tape for protection from hydrogen sulfide gas attack. The refrigerator thermostat is capable of maintaining a temperature of 0–4° C. The evaporator plates have a baked-on, powder coat paint finish to protect the metal. The fan motor is unit bearing.

The 440 BTU compressor has a high efficiency fan and condenser arrangement permitting reliable operation in high ambient temperatures. Foam insulation forms a CFC-free polyethylene with an interior of food-grade plastic. The capacity is 6.1 cu. ft. The **4.9 Cubic Ft. Refrigerator** is for single bottle use, only when protected from the elements, and for indoor or sheltered applications. The exterior is black enamel coated steel. The cabinet and door insulation is polyurethane with an interior plastic liner for cabinet and door of food-grade quality. The refrigerator thermostat is capable of maintaining the EPA-recommended temperature of 0–4° C provided the ambient temperature is within the specifications listed in the 4.9 Cubic Ft. Refrigerator data sheet. The capacity is 4.9 cu. ft. The 4.9 Cubic Ft. Refrigerator is not available on the S-5200. Please see the 4.9 Cubic Ft. Refrigerator Data Sheet for more specifications.

9. A high pressure pre-sample and post sample purge shall be provided to prevent clogging and reduce cross contamination.
10. The sampler shall be capable of collecting composite samples in bottles as specified by purchaser. Polyethylene bottles should be available in 2.5 gal, 4 gal, and 5 gal. A 2.5-gallon glass bottle with Teflon® cap liner should also be available.
11. Power for the unit shall be a minimum of 110 VAC, 60 Hz, 20 A service.
12. An optional weighted sampling strainer of PVC or stainless steel is also available.
13. The sampler shall be a Manning Environmental, Inc. S-5000.

S-5200 Composite Dual Sampler

1. The sampler shall incorporate the vacuum compressor technique of sampling, with the sampling mechanism consisting of dual, heavy-duty compressors, dual one-liter measuring chambers, independent control circuitry, and all necessary valving for proper operation for each sampler portion. All components shall be panel-mounted in a single heavy-gauge metal housing with the sampler containers located below in a refrigerated compartment maintained to 0–4° C. The sampler housing shall comply with the NEMA 12 specification.

2. Each sampling system shall be capable of drawing up to one-liter samples through a 5/8 inch (1.6 cm) ID inlet hose at a sample velocity of 9.75 liters per minute at 5 ft. of lift to assure a representative sample.

The samples shall be collected in a clear measuring chamber with the sample volume adjustable from 20 ml to one liter. The sample shall be drawn into the chamber through a minimum 5/8 inch (1.6 cm) ID nylon-reinforced PVC or clear PVC sample hose.

3. All portions of the fluid path shall be nonmetallic in order to withstand most acids and bases, and to avoid sample contamination. No liquid sample shall pass through any pump.

4. In the event the first attempt to take a sample is prevented due to clogging, a second sample cycle shall be automatically instituted.
5. The sampler shall be capable of operating on a flow-proportional basis as controlled by a contact closure from an external flow meter, or an optional 4–20-mA flow rate signal with fully adjustable sample rate control.
6. The unit shall also be capable of operating on a time control basis by the use of clock circuitry with a switch-selectable setting from 3.75 minutes to 24 hours.
7. Optional: The entire sampler, control cabinet and refrigeration unit, shall be enclosed in a weather resistant NEMA 3R outdoor enclosure. The enclosure shall be of fiberglass-reinforced polyester with a minimum 1.9 cm (0.75 in.) thick polyurethane insulation encapsulated in the walls, ceiling and floor. A full-sized, heavily gasketed door with lockable latch shall be included. A heater with thermostat suitable for operation of sampler to -40° F (-40° C.) shall be installed in the enclosure. Consult factory for use with S-5200.
8. Refrigeration: The **6.1 Cubic Ft. Refrigerator** is composed of carbon steel (with iron phosphate pretreatment, covered by white baked acrylic enamel) or stainless steel. The refrigerator condenser is made of carbon steel with a baked enamel finish. Copper refrigerant lines are coated with asphalt cork tape for protection from hydrogen sulfide gas attack. The refrigerator thermostat is capable of maintaining a temperature of 0–4° C. The evaporator plates have a baked-on, powder coat paint finish to protect the metal. The fan motor is unit bearing. The 440 BTU compressor has a high efficiency fan and condenser arrangement permitting reliable operation in high ambient temperatures. Foam insulation forms a CFC-free polyethylene with an interior of food-grade plastic. The capacity is 6.1 cu. ft.
9. High-pressure pre- and post-sample purges shall be provided to prevent clogging and reduce cross contamination.
10. The sampler shall be capable of collecting composite samples in two bottles as specified by purchaser. Polyethylene bottles should be available in 2.5 gal, 4 gal, and 5 gal. A 2.5-gallon glass bottle with Teflon cap liner should also be available.
11. Power for the unit shall be a minimum of 110 VAC, 60 Hz, 15 A.
12. Optional weighted sampling strainers of PVC or stainless steel are also available.
13. The sampler shall be a Manning Environmental, Inc. S-5200.

Data Sheet S-5X00 09/14/09

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