

### Model YB Stationary Peristaltic Samplers (Refrigerated)



YB Sampler with Standard Refrigerator



YB Sampler with Multi-bottle Option



YB Sampler with Single Bottle

#### ◆ Multiple Uses.

Model YB samplers provide composite or discrete sampling of non-toxic liquids. Sophisticated software coupled with either continuity or advanced ultrasonic fluid sensor technology ensures that YB samplers deliver accurate and repeatable sample volumes. YB samplers are ideal for a wide range of applications including National Pollutant Discharge Elimination System (NPDES) compliance, industrial-treatment, combined sewer overflow, sewer inflow and infiltration, storm water, wastewater treatment plant process control, and many more.

#### ◆ Reliable Peristaltic Pump.

YB samplers employ a field-proven 3/8-in (9.53 mm) internal diameter (ID) peristaltic pump to collect samples. The pump meets Environmental Protection Agency (EPA) criteria for representative intake velocities, and is constructed of advanced thermoplastics to resist corrosion and ensure rigidity. The pump rollers and tubing can be visually inspected without dismantling the pump. The YB delivers consistent and accurate sample volumes even with changing head heights.

#### ◆ Durable Construction.

The YB sampler is constructed of materials that will stand the test of time. The thick walls of the controller enclosure are made of impact and corrosion-resistant structural resin. Watertight connectors are also provided for external wiring.

#### ◆ Standard Refrigerator.

The optional refrigerator 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, refrigerant lines wrapped with asphalt cork tape to resist damaging environments, non-ferrous evaporation coils with corrosion resistant finish, and a heavy-duty compressor enable reliable operation under the harshest conditions. The standard refrigerator is available in your choice of white baked enamel or stainless steel exterior.

#### ◆ 4.9 cu. ft. Refrigerator.

Proudly introduced, in Spring 2005, this unit is offered as an economical alternative to the Industrial Grade (Standard) Refrigerator and can be used with the Manning YB, 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 40–110° F (4.44–43.33° 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 cu. ft. Refrigerator Data Sheet for more specifications.

#### ◆ Versatile Controller.

The sampler's microprocessor-based controller is housed in an enclosure rated as NEMA 4X/NEMA 6 for environmental protection by the National Electrical Manufacturers Association. 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 backlit LCD, the controller is simple to set up, even in the dark! Easy-to-understand prompts and shortcut keys save manpower and time by enabling the operator to quickly change or review programming and settings, thus avoiding frustrating navigation through long, complicated menu structures.

#### ◆ Comprehensive, Flexible Programming.

The exceptional sampling software is designed to be highly flexible and easy to use. The menu-driven system provides many programming features. (See partial listing in specifications on page 2.)

#### ◆ Single or Multiple Bottle Sampling.

The YB sampler has various bottle options for single, 2, 4, or 24-bottle sampling. The multi-bottle YB is convertible in the field to single bottle without requiring special tools (see Accessories).

# Specifications

Size .....	Controller, including Pump Housing: W 10.75 in. (273.05 mm) × H 7.00 in. (177.8 mm) × D 9.75 in. (247.65 mm) Standard Refrigerator: W 23.875 in. (606.42 mm) × H 34.5 in. (876.30 mm) × D 24 in. (609.60 mm). 4.9 cu. ft. Refrigerator: W 21.25" (539.75 mm) × H 33.5" (850.90 mm) × D 23" (584.20 mm). Optional NEMA 3R Sampler Enclosure: W 32 in. (812.80 mm) × H 74 in. (1879.60 mm) × D 30 in. (762 mm)
Weight (dry) .....	YB Sampler: 10 lbs (4.54 kg). Standard Refrigerator: 110 lbs (49.9 kg). 4.9 cu. ft. Refrigerator: 50.5 lbs (22.91 kg). Distribution assembly with multi-bottle suspension plate and 24 empty 1000-ml bottles: 15.5 lbs (7.03 kg). Single bottles: Weights vary with size and material. All weights are without packaging or pallets.
Environmental Protection .....	NEMA 4X/NEMA 6 structural resin housing around electromechanical components
Refrigeration.....	Standard Refrigerator (available in white enamel or stainless steel finish) is capable of maintaining samples at 32–39°F (0–4°C) within an ambient temperature range of 32–122°F (0–50°C). 4.9 cu. ft. Refrigerator (black enamel finish) is capable of maintaining samples at 32–39 °F (0–4° C) within an ambient temperature range of 40–110° F (4.44–43.34° C).
Temperature Limits .....	Standard unit: 32–122°F (0–50°C); Unit in NEMA 3R Enclosure with heater: -40–122°F (-40–50°C)
Sampler Pump .....	High-speed 3/8-in (9.53 mm) peristaltic 12 VDC pump with impact and corrosion-resistant plastic pump body, and dual-roller mechanism
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 .....	±5% typical of set sample volume
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
Sample Programming .....	Programming features include, but are not limited to:
	<ul style="list-style-type: none"><li>• Data logging (512 event capacity)</li><li>• Flow-proportional pacing (contact closure)</li><li>• Flow pacing with time override capability</li><li>• Flow pacing with delay sampling feature</li><li>• Flow pacing with maintained event sampling</li><li>• Totalized flow pacing (analog input)</li><li>• Uniform and non-uniform time intervals</li><li>• Multiple bottles per sample</li><li>• Pump tubing life warning indication</li><li>• Multiple bottle compositing</li><li>• Program delay (time or flow)</li><li>• Sampling based on external device input</li><li>• Hydrologic level event mode (storm water sampling)</li><li>• Real-time clock</li><li>• Password protection</li><li>• Settable sample volume</li><li>• Manual test cycle</li><li>• Activity review log (current and past)</li><li>• Intake fault alert</li><li>• Intake line rinse</li><li>• Intake line purge</li><li>• Automatic shut-off</li><li>• Power fail/auto restart</li><li>• Multiple samples per bottle</li></ul>
Internal Clock .....	Indicates real time with ± 1 minute per month accuracy
Internal Battery Backup.....	5-year internal lithium battery to maintain program logic, RAM memory, real-time clock, and date
Power Requirement .....	110 VAC, 220 VAC, 110 VAC with battery backup, or 220 VAC with battery backup
Alarm Contacts (optional).....	Three SPST contacts rated 5 A 110/220 VAC
Input/Output (optional) .....	Closed-contact or 12 VDC pulsed input with or without 4–20-mA input and/or RS-232 output in various combinations
Warranty:.....	One year from date of shipment.

# Accessories

## Model YB Sampler Spare Parts/Accessories

- **Replacement Pump Tubing**  
3/8-in (9.53 mm) silicone tubing (pre-cut 18-inch length for use with continuity fluid sensor) P/N 889925  
3/8-in (9.53 mm) silicone tubing (pre-cut 22-inch length for use with ultrasonic fluid sensor) P/N 889923  
3/8-in (9.53 mm) silicone tubing (bulk by the foot) P/N 566925B
- **Cables**  
3 ft (1 m) long, 4-pin plug contact/pulse/analog Input cable P/N 818016  
10 ft (3 m) long, 4-pin plug contact/pulse/analog cable P/N 818018  
Serial output (RS-232 6-inch patch cable) P/N 810059
- **Quick Disconnect Fittings**  
3/8-in (9.53 mm) female P/N 552104  
3/8-in (9.53 mm) male P/N 552105
- **Replacement Intake Hose**  
3/8-in (9.53 mm) bulk clear intake hose P/N 566917\*  
3/8-in (9.53 mm) bulk Teflon®-lined intake hose P/N 566920\*  
*\*Please specify required length in feet.*
- **Replacement Bottles**  
One 2.5-gal (9.46 L) polyethylene bottle w/cap P/N 687547  
One 4-gal (15.4 L) polyethylene bottle w/cap P/N 687551  
One 5-gal (18.93 L) polyethylene bottle w/cap P/N 687535  
One 2.5-gal (9.45 L) glass bottle w/Teflon lid liner P/N 889715  
Set of 24 1000-ml polyethylene bottles w/caps P/N 889117  
Set of 24 500-ml polyethylene bottles w/caps P/N 889041  
5-gal (18.93 L) Bucket Mann™ with splashguard & transport lid P/N 889721
- **Strainers**  
3/8-in (9.53 mm) PVC P/N 889147  
3/8-in (9.53 mm) stainless steel (316 grade) P/N 579591
- **Conversion Kits**  
3/8-in (9.53 mm) multi-bottle to single bottle conversion kit P/N 885014
- **Cool Mann Jr.™**  
Radiant barrier wrap for Bucket Mann™ P/N 889725
- **Manual**  
Model YB Sampler Manual P/N MAN-YBX

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

**MODEL NUMBER**

YB8 3/8-in (9.53 mm) ID peristaltic pump stationary sampler system.

**POWER REQUIREMENT**

- |                  |   |
|------------------|---|
| <b>A</b> 110 VAC | <b>C</b> Battery backup -- 110 VAC (for sampler only -- not refrigerator) |
| <b>B</b> 220 VAC | <b>D</b> Battery backup -- 220 VAC (for sampler only -- not refrigerator) |

**REFRIGERATOR**

- |  |   |
|--|---|
| <b>1</b> None                              | <b>4</b> Standard (Stainless Steel) -- 110 VAC, 60 Hz |
| <b>2</b> Standard (White)-- 110 VAC, 60 Hz | <b>5</b> Standard (Stainless Steel) -- 220 VAC, 50 Hz |
| <b>3</b> Standard (White)-- 220 VAC, 50 Hz | <b>8</b> 4.9 cu. ft. -- 110 VAC, 60 Hz*               |

\* Recommended for single bottle applications, protected from the elements, indoors, or in a shelter only. Hood Option not available on this refrigerator. See 4.9 cu. ft. Refrigerator Data Sheet

**INPUT/OUTPUT OPTION**

(3 ft (0.91 m) input cable included on all units and patch cable for RS-232 output when applicable)

- |                                       |                                       |
|---------------------------------------|---------------------------------------|
| <b>A</b> Contact closure input        | <b>E</b> 12 VDC pulsed input          |
| <b>B</b> Option A plus 4--20 mA input | <b>F</b> Option E plus 4--20-mA input |
| <b>C</b> Option A plus RS-232 output  | <b>G</b> Option E plus RS-232 output  |
| <b>D</b> Option B plus RS-232 output  | <b>H</b> Option F plus RS-232 output  |

**FLUID SENSOR**

- 1** Continuity Sensor
- 2** Ultrasonic sensor

**BOTTLE CONFIGURATION**

- |   |  |
|---|--|
| <b>A</b> 1 bottle for non-toxic liquids with bottle full sensor | <b>D</b> Multi-Bottle for discrete sampling (2 or 4 bottle distribution) |
| <b>C</b> 24 bottles for non-toxic liquids                       |  |

**BOTTLE TYPE**

- |  |  |
|--|--|
| <b>1</b> None  | <b>9</b> 5-gal (18.93 L) polyethylene container with splashguard/transport lid |
| <b>2</b> 2.5-gal (9.46L) polyethylene                | <b>10</b> 4 each 2.5-gal polyethylene carboys                                  |
| <b>3</b> 5-gal (18.93 L) polyethylene                | <b>11</b> 2 each 2.5-gal polyethylene carboys                                  |
| <b>4</b> 4-gal (15.4 L) polyethylene                 |  |
| <b>5</b> 2.5-gal (9.45 L) glass w/Teflon cap         |  |
| <b>6</b> 24 each 1000-ml polyethylene (multi-bottle) |  |
| <b>7</b> 24 each 500-ml polyethylene (multi-bottle)  |  |

**SAMPLING HOSE TYPE**

If no sampling hose is ordered, please add 552104 Quick Disconnect Connector. All hose listed is 3/8-in (9.53 mm) ID

- |                                       |   |
|---------------------------------------|---|
| <b>A</b> None                         | <b>K</b> Teflon <sup>®</sup> hose -- 10 ft (3.05 m)   |
| <b>B</b> PVC hose -- 10 ft (3.05 m)   | <b>L</b> Teflon <sup>®</sup> hose -- 25 ft (7.62 m)   |
| <b>C</b> PVC hose -- 25 ft (7.62 m)   | <b>M</b> Teflon <sup>®</sup> hose -- 50 ft (15.24 m)  |
| <b>D</b> PVC hose -- 50 ft (15.24 m)  | <b>N</b> Teflon <sup>®</sup> hose -- 100 ft (30.48 m) |
| <b>E</b> PVC hose -- 100 ft (30.48 m) |   |

**SAMPLING STRAINER TYPE**

- 1** None
- 2** PVC strainer
- 3** 100% stainless steel strainer - 3/8 in (9.53 mm)

**ENVIRONMENTAL PROTECTION\***

- |  |
|--|
| <b>A</b> None  |
| <b>C</b> Hood, no heater (Not available with 4.9 cu. ft. Refrigerator) |
| <b>G</b> NEMA 3R fiberglass insulated sampler enclosure                |
| <b>H</b> NEMA 3R sampler enclosure with heater                         |
| <b>J</b> NEMA 3R sampler enclosure with light                          |
| <b>K</b> NEMA 3R sampler enclosure with fan                            |
| <b>L</b> NEMA 3R sampler enclosure with heater, light, and fan         |
| <b>M</b> NEMA 3R sampler enclosure with heater and light               |
| <b>N</b> NEMA 3R sampler enclosure with heater and fan                 |
| <b>P</b> NEMA 3R sampler enclosure with light and fan                  |

\*Fan recommended on all units. Please consult factory for 220 V applications.

**ALARMS**

- 1** None
- 2** Three alarm contacts (sample in progress, missed sample, and bottle-full condition for a single bottle sampler or end-of-sample sequence for a multiple bottle sampler)

Manual included with all samplers.

YB8

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 4.9 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 4.9 cu. ft (0.14 cu. m). Please see the 4.9 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 polyethylene 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 YB 05/17/11

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